

ACOUSTIK ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK

ASTM E90 AND ASTM E492 TESTING ON 8.4 MM ENGINEERED WOOD OVER
12 MM ACOUSTIK RUBBER UNDERLAYMENT

SPECIMEN TYPE

Dimensional Lumber - 2x10

REPORT NUMBER

R5380.40-113-11-R0

TEST DATE

08/05/24

ISSUE DATE

08/28/24

RECORD RETENTION END

08/05/28

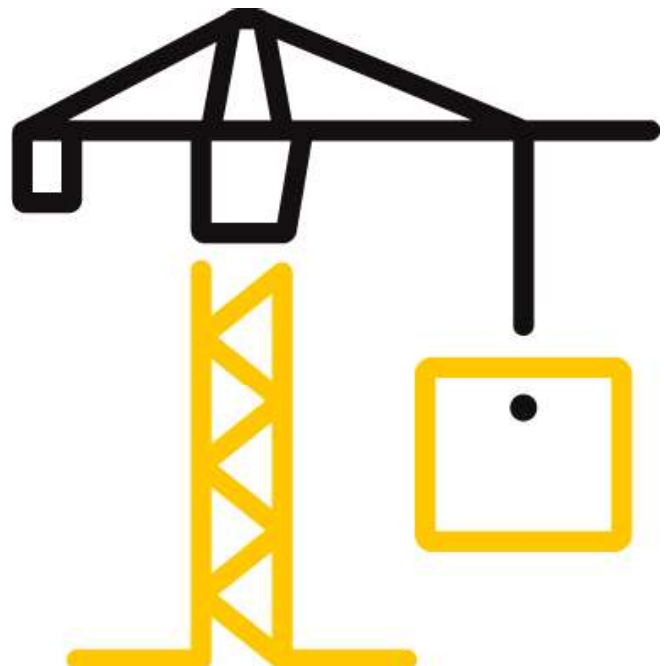
PAGES

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TEST REPORT FOR ACOUSTIK Report No.:
R5380.40-113-11-R0 Date: 08/28/24

**REPORT RENDERED BY MANUFACTURER FOR
ACOUSTICAL SURFACES INC.**
123 Columbia Court N.
Chaska, Minnesota 55318

SECTION 1 SCOPE

Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted by the client to perform testing in accordance with ASTM E90 AND ASTM E492 on 8.4 mm Engineered wood over 12 mm ACOUSTIK Rubber Underlayment. Results obtained are tested values and were secured by using the designated test methods. Testing was conducted in the VT test chambers at Intertek B&C located in York, Pennsylvania. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

SECTION 2 SUMMARY OF TEST RESULTS

DATA FILE NO.	R5380.40
SERIES/MODEL:	8.4 mm Engineered wood over 12 mm ACOUSTIK Rubber Underlayment
STC	60
IIC	60
HIIC	66

COMPLETED BY: Corey S. Kohler
Technician - Acoustical
TITLE: Testing
SIGNATURE: 
Digitally Signed by: Corey Kohler
DATE: 08/28/24

REVIEWED BY: Daniel B. Mohler
Project Manager - Acoustical
TITLE: Testing
SIGNATURE: 
Digitally Signed by: Daniel Mohler
DATE: 08/28/24

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SECTION 3**TEST METHODS**

The specimen was evaluated in accordance with the following:

ASTM E90-09 (2016), *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions*

ASTM E413-22, *Classification for Rating Sound Insulation*

ASTM E492-22, *Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine*

ASTM E989-21, *Classification for Determination of Impact Insulation Class (IIC)*

ASTM E2235-04 (2020), *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*

ASTM E3207-21, *Standard Classification for Determination of Low-Frequency Impact Sound Ratings*

ASTM E3222-20, *Standard Classification for Determination of High-Frequency Impact Sound Ratings*

SECTION 4**MATERIAL SOURCE/INSTALLATION**

The full test specimen was assembled on the day of testing by B&C. All materials provided by the client were installed on an existing B&C assembly (Dimensional Lumber - 2x10) utilizing B&C-supplied materials. The assembly was installed in a steel test frame which was installed into the opening between the source and receive rooms in the test chamber. The test frame was isolated from the structure with dense neoprene gasket.

The total weight of the floor/ceiling assembly was 1042.1 kg. B&C will store samples of the test specimen for four years. Photographs of the test specimen are included in the report. A drawing of the test specimen is included in the report.

B&C will service this report for the entire test record retention period. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by B&C for the entire test record retention period.

Unless differently required, Intertek reports apply the "Simple Acceptance" rule, also called "Shared Risk approach," of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.

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SECTION 5 EQUIPMENT

INSTRUMENT	MANUFACTURER	MODEL	DESCRIPTION	ASSET #	CAL DATE	
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02672	10/23	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02673	10/23	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02674	10/23	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02675	10/23	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02676	10/23	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02677	10/23	*
2-Channel Analog Output	National Instruments	NI 9260	2-Channel Analog Output	INT02611	N/A	*
Microphone Calibrator	Norsonic	34093	Acoustical Calibrator	65105	09/23	
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	64908	01/24	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64909	07/24	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	INT02912	03/24	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64902	09/23	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64910	02/24	
Receive Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63810	10/23	
				63811	10/23	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	64911	09/23	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	64907	01/24	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT02256	01/24	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00235	06/24	
Source Room Microphone	PCB Electronics	378C20	Microphone and Preamplifier	INT00236	06/24	
Source Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63812	11/23	
Tapping Machine	Norsonic	Nor277	Tapping Machine	INT03333	02/24	

* The calibration frequency for this equipment is every two years per the manufacturer's recommendation.

VT RECEIVE ROOM VOLUME	157.83 m ³
VT SOURCE ROOM VOLUME	190 m ³

SECTION 6 LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Michael A. Unnone	Intertek B&C
Daniel B. Mohler	Intertek B&C

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SECTION 7**TEST PROCEDURE**

The microphones were calibrated before conducting the tests. The air temperature and relative humidity conditions were monitored and recorded during all measurements. The average temperature and humidity of both the source and receive rooms are listed in Sections 10 and 11. The maximum and minimum temperatures and humidities of the receive room from the duration of the test are listed in Sections 12 and 13.

The airborne transmission loss test was conducted in accordance with the ASTM E90 test method using the single direction method. Two background noise sound pressure level and five sound absorption measurements were conducted at each of five microphone positions. Two sound pressure level measurements were made simultaneously in both rooms, at each of five microphone positions.

The impact sound transmission test was conducted in accordance with the ASTM E492 test method. Two background noise sound pressure level, two sound pressure level measurements with the tapping machine operating at each position specified by ASTM E492, and five sound absorption measurements were conducted at each of five microphone positions.

Detailed test procedures, data for flanking limit tests, repeatability measurements, and reference specimen tests are available upon request.

SECTION 8**TEST CALCULATIONS**

The STC (Sound Transmission Class), IIC (Impact Insulation Class), and HIIC (High-Frequency Impact Insulation Class) ratings were calculated in accordance with ASTM E413, ASTM E989, and ASTM E3222, respectively.

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SECTION 9

TEST SPECIMEN DESCRIPTION

MATERIAL	DIMENSIONS (mm)	THICKNESS (mm)	MANUFACTURER AND SERIES	QUANTITY	AVERAGE WEIGHT
Engineered Wood	127 by Varied	8.4	Shaw	10.98 m ²	7.32 kg/m ²
	Note: Loose laid				
Rubber Underlayment	1219.2 by 3023	12.0	ACOUSTIK	10.98 m ²	8.69 kg/m ²
	Note: Loose laid				
Floor Underlayment	3023 by 3632	19.1	USG Levelrock® 2500	10.98 m ²	40.67 kg/m ²
	Note: Poured directly on top of the subfloor, cured a minimum of 14 days. No noticeable shrinkage or cracking was visible on the specimen.				
Oriented Strand Board Sheathing	1219 by 2438	18.8	N/A	10.98 m ²	13.82 kg/m ²
	Note: Fastened to joists with 76 mm by 3 mm framing nails on 203 mm centers along perimeter and 305 mm centers in the field.				
Fiberglass Insulation	520.7 by 3023	88.9	Johns Manville Unfaced R-13	10.98 m ²	1.32 kg/m ²
	Note: Installed in the cavity between trusses, stapled flush with the subfloor				
2x10 Dimensional Lumber	2940 by 38.1	235.0	N/A	26.5 lin m	4.3 kg/m
	Note: Fastened to perimeter frame on 406 mm centers using 18 gauge joist hangers and 9 gauge 31.75 mm nails.				
Resilient Channel	68.6 by 3454.4	12.7	ClarkDietrich RC Deluxe™	27.6 lin m	0.33 kg/m
	Note: Installed on 406 mm centers perpendicular to the trusses. The measured thickness of the metal was 0.7 mm.				
Gypsum Panel	1219 by 3023	15.9	USG SHEETROCK® Brand FIRECODE® C Core	10.98 m ²	11.91 kg/m ²
	Note: Fastened to the channels on 305 mm centers with 25.4 mm Type S bugle head screws. The seams of the gypsum panels were sealed with Pecora AC-20 FTR caulk and covered with pressure sensitive tape.				

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SECTION 10

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS



TEST DATE	8/5/2024				
DATA FILE NO.	R5380.40				
CLIENT	Acoustical Surfaces, Inc.				
DESCRIPTION	8.4 mm Shaw Engineered Wood, 12 mm ACOUSTIK Rubber Underlayment, 19.1 mm USG Levelrock® 2500 Floor Underlayment, 18.8 mm Oriented Strand Board Sheathing, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 235 mm 2x10 Dimensional Lumber, 12.7 mm ClarkDietrich RC Deluxe™ Resilient Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m²	Receive Temp.	25.6°C	Source Temp.	24.8°C
TECHNICIAN	MAU	Receive Humidity	74%	Source Humidity	74%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m²	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% SAMPLING LIMIT	NUMBER OF DEFICIENCIES
50	34.8	33.3	93	63	26	3.0	-
63	32.7	23.8	92	57	32	3.7	-
80	29.1	14.9	88	60	27	4.0	-
100	25.8	9.1	86	55	32	1.5	-
125	27.8	8.7	87	50	40	2.9	4
160	20.2	8.0	89	50	41	0.9	6
200	18.0	10.7	89	43	47	2.1	3
250	13.6	9.6	92	45	48	0.8	5
315	16.8	8.7	96	47	51	1.0	5
400	12.3	8.4	95	42	54	0.9	5
500	10.7	7.5	93	38	58	0.7	2
630	13.6	7.4	96	38	60	0.6	1
800	13.8	7.1	96	35	63	0.5	0
1000	14.3	7.4	95	34	64	0.5	0
1250	12.4	7.5	96	33	65	0.3	0
1600	10.8	7.4	95	30	67	0.6	0
2000	9.4	7.9	95	30	67	0.3	0
2500	8.0	8.9	93	27	68	0.4	0
3150	7.7	8.9	92	23	71	0.5	0
4000	8.2	12.9	93	21	72	0.7	0
5000	8.9	16.5	93	17	75	1.0	-
6300	9.5	14.5	87	10	76	1.1	-
8000	10.2	23.6	87	9	74	1.4	-
10000	10.8	23.6	81	9	69	1.6	-
STC Rating	60	(Sound Transmission Class)			Sum of Deficiencies	31	

- Notes:
- 1) Receive Room levels less than 5 dB above the Background levels are highlighted in yellow.
 - 2) Specimen TL levels listed in red are potentially limited by the laboratory flanking limit.
 - 3) Specimen TL levels listed in blue indicate the lower limit of the transmission loss.
 - 4) Specimen TL levels listed in green indicate that there has been a filler wall correction applied

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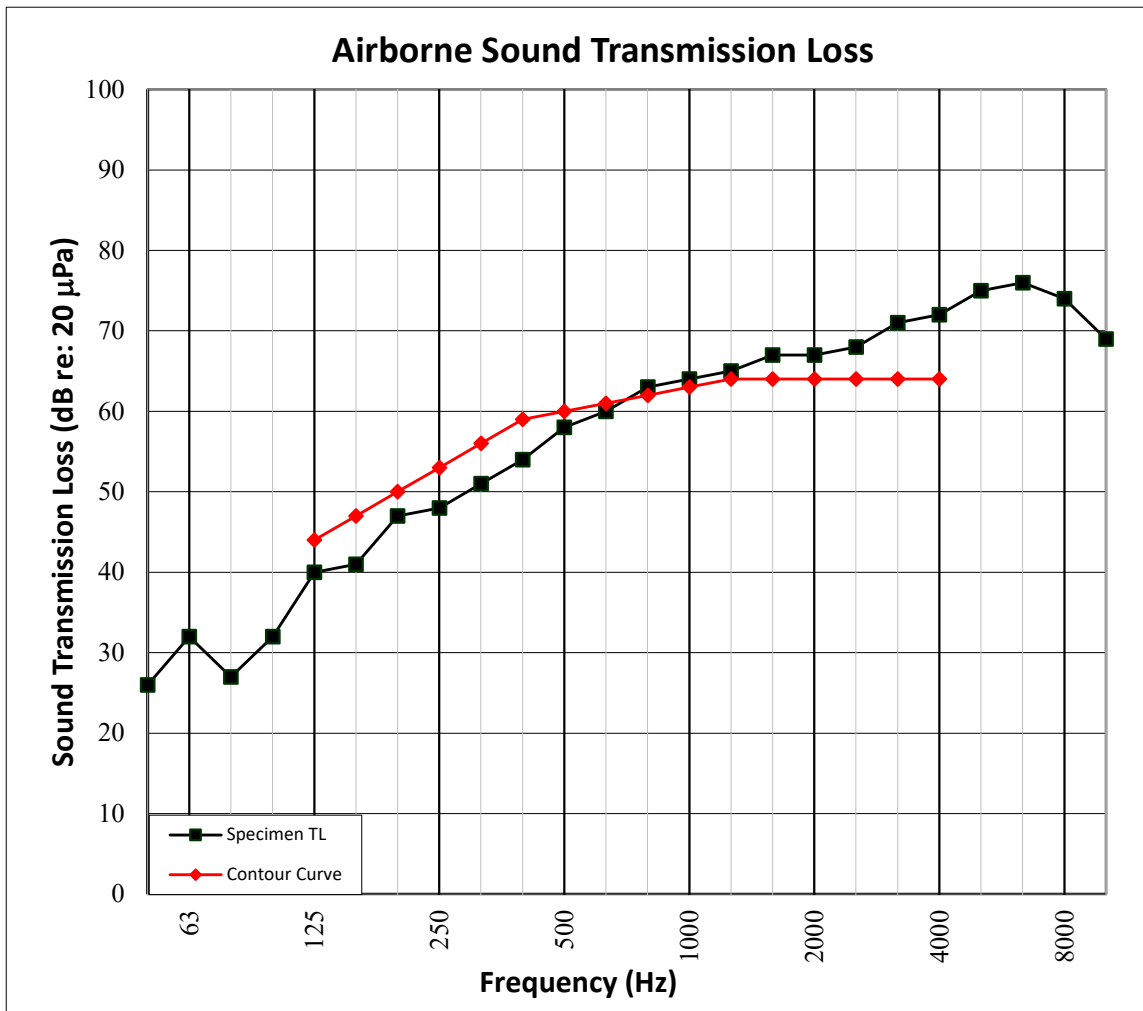
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SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH



TEST DATE	8/5/2024				
DATA FILE NO.	R5380.40				
CLIENT	Acoustical Surfaces, Inc.				
DESCRIPTION	8.4 mm Shaw Engineered Wood, 12 mm ACOUSTIK Rubber Underlayment, 19.1 mm USG Levelrock® 2500 Floor Underlayment, 18.8 mm Oriented Strand Board Sheathing, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 235 mm 2x10 Dimensional Lumber, 12.7 mm ClarkDietrich RC Deluxe™ Resilient Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Receive Temp.	25.6°C	Source Temp.	24.8°C
TECHNICIAN	MAU	Receive Humidity	74%	Source Humidity	74%



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SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION



TEST DATE	8/5/2024				
DATA FILE NO.	R5380.40				
CLIENT	Acoustical Surfaces, Inc.				
DESCRIPTION	8.4 mm Shaw Engineered Wood, 12 mm ACOUSTIK Rubber Underlayment, 19.1 mm USG Levelrock® 2500 Floor Underlayment, 18.8 mm Oriented Strand Board Sheathing, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 235 mm 2x10 Dimensional Lumber, 12.7 mm ClarkDietrich RC Deluxe™ Resilient Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m²	Maximum Temp.	25.6°C	Minimum Temp.	25.6°C
TECHNICIAN	MAU	Max. Humidity	74%	Min. Humidity	73%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m²	NORMALIZED IMPACT SPL (dB)	95% SAMPLING LIMIT	NUMBER OF DEFICIENCIES
50	40.0	32.9	71	1.9	-
63	32.9	25.0	68	3.7	-
80	31.6	14.1	59	1.1	-
100	32.2	8.4	59	1.3	7
125	28.4	8.1	58	1.2	6
160	24.0	8.5	57	1.2	5
200	19.1	10.6	57	0.9	5
250	15.8	9.3	56	0.7	4
315	17.3	8.8	53	0.7	1
400	13.4	8.5	50	0.3	0
500	14.9	7.4	47	0.3	0
630	15.8	7.4	47	0.3	0
800	15.2	7.0	41	0.3	0
1000	16.1	7.4	37	0.4	0
1250	13.1	7.5	33	0.4	0
1600	11.4	7.2	30	0.4	0
2000	10.0	7.9	31	0.7	0
2500	8.7	9.0	32	1.0	0
3150	8.0	8.9	28	1.0	0
4000	8.3	12.9	25	1.7	-
5000	8.9	16.5	24	2.2	-
6300	9.5	14.5	19	2.0	-
8000	10.2	23.6	17	1.5	-
10000	10.8	23.6	13	0.8	-
IIC Rating	60	(Impact Insulation Class)		Sum of Deficiencies	28

Notes: Receive Room levels less than 5 dB above the Background levels are highlighted in yellow.

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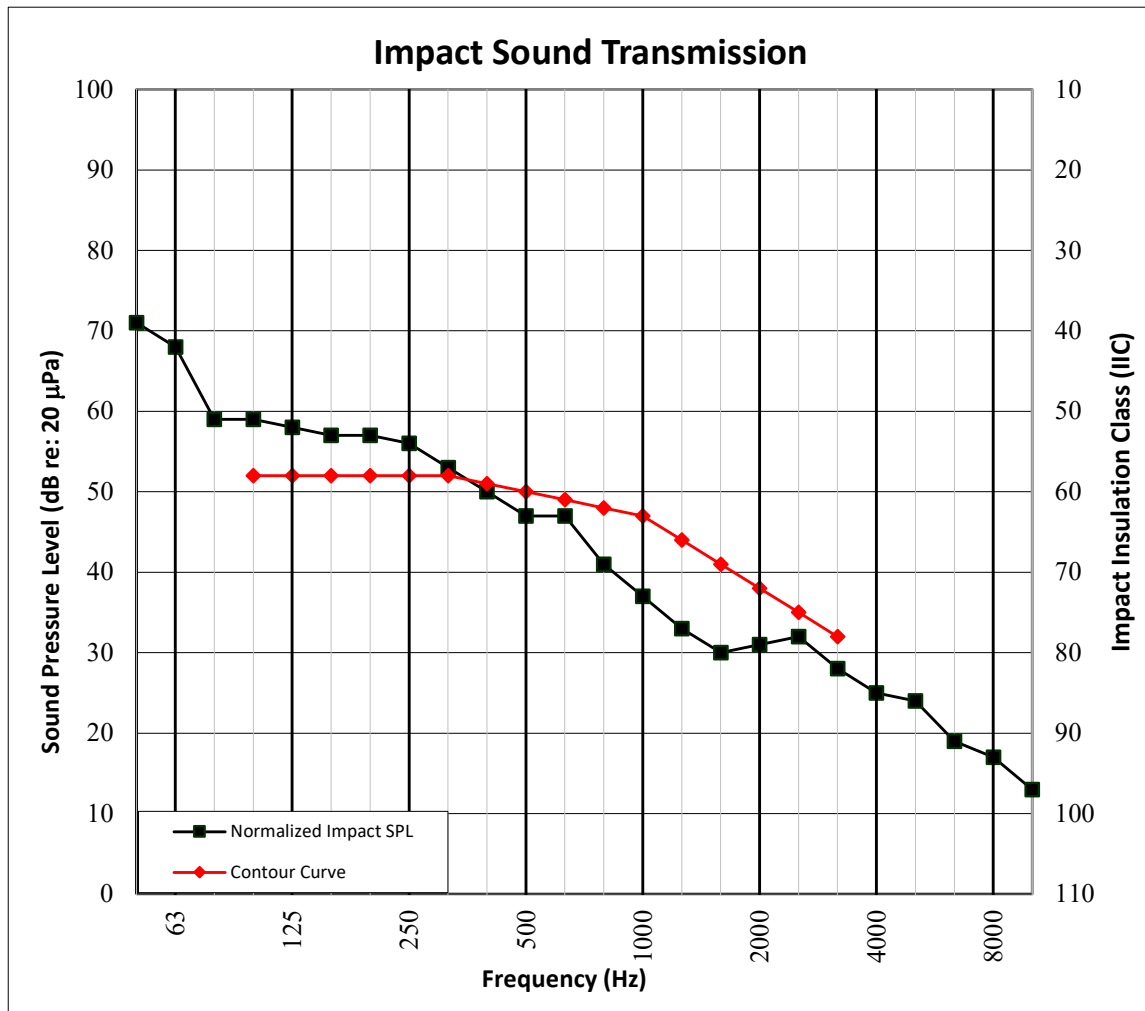
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SECTION 13

TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH



TEST DATE	8/5/2024				
DATA FILE NO.	R5380.40				
CLIENT	Acoustical Surfaces, Inc.				
DESCRIPTION	8.4 mm Shaw Engineered Wood, 12 mm ACOUSTIK Rubber Underlayment, 19.1 mm USG Levelrock® 2500 Floor Underlayment, 18.8 mm Oriented Strand Board Sheathing, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 235 mm 2x10 Dimensional Lumber, 12.7 mm ClarkDietrich RC Deluxe™ Resilient Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	25.6°C	Minimum Temp.	25.6°C
TECHNICIAN	MAU	Max. Humidity	74%	Min. Humidity	73%



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SECTION 14

TEST RESULTS - HIGH-FREQUENCY IMPACT SOUND TRANSMISSION



TEST DATE	8/5/2024				
DATA FILE NO.	R5380.40				
CLIENT	Acoustical Surfaces, Inc.				
DESCRIPTION	8.4 mm Shaw Engineered Wood, 12 mm ACOUSTIK Rubber Underlayment, 19.1 mm USG Levelrock® 2500 Floor Underlayment, 18.8 mm Oriented Strand Board Sheathing, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 235 mm 2x10 Dimensional Lumber, 12.7 mm ClarkDietrich RC Deluxe™ Resilient Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	25.6°C	Minimum Temp.	25.6°C
TECHNICIAN	MAU	Max. Humidity	74%	Min. Humidity	73%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	NORMALIZED IMPACT SPL (dB)	95% SAMPLE CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
400	13.4	8.5	50	0.3	4.9
500	14.9	7.4	47	0.3	3.4
630	15.8	7.4	47	0.3	3.5
800	15.2	7.0	41	0.3	0.0
1000	16.1	7.4	37	0.4	0.0
1250	13.1	7.5	33	0.4	0.0
1600	11.4	7.2	30	0.4	0.0
2000	10.0	7.9	31	0.7	0.0
2500	8.7	9.0	32	1.0	3.1
3150	8.0	8.9	28	1.0	1.7
HIIC Rating	66	(High-Frequency Impact Insulation Class)		Sum of Deficiencies	16.6

Notes: Receive Room levels less than 5 dB above the Background levels are highlighted in yellow.

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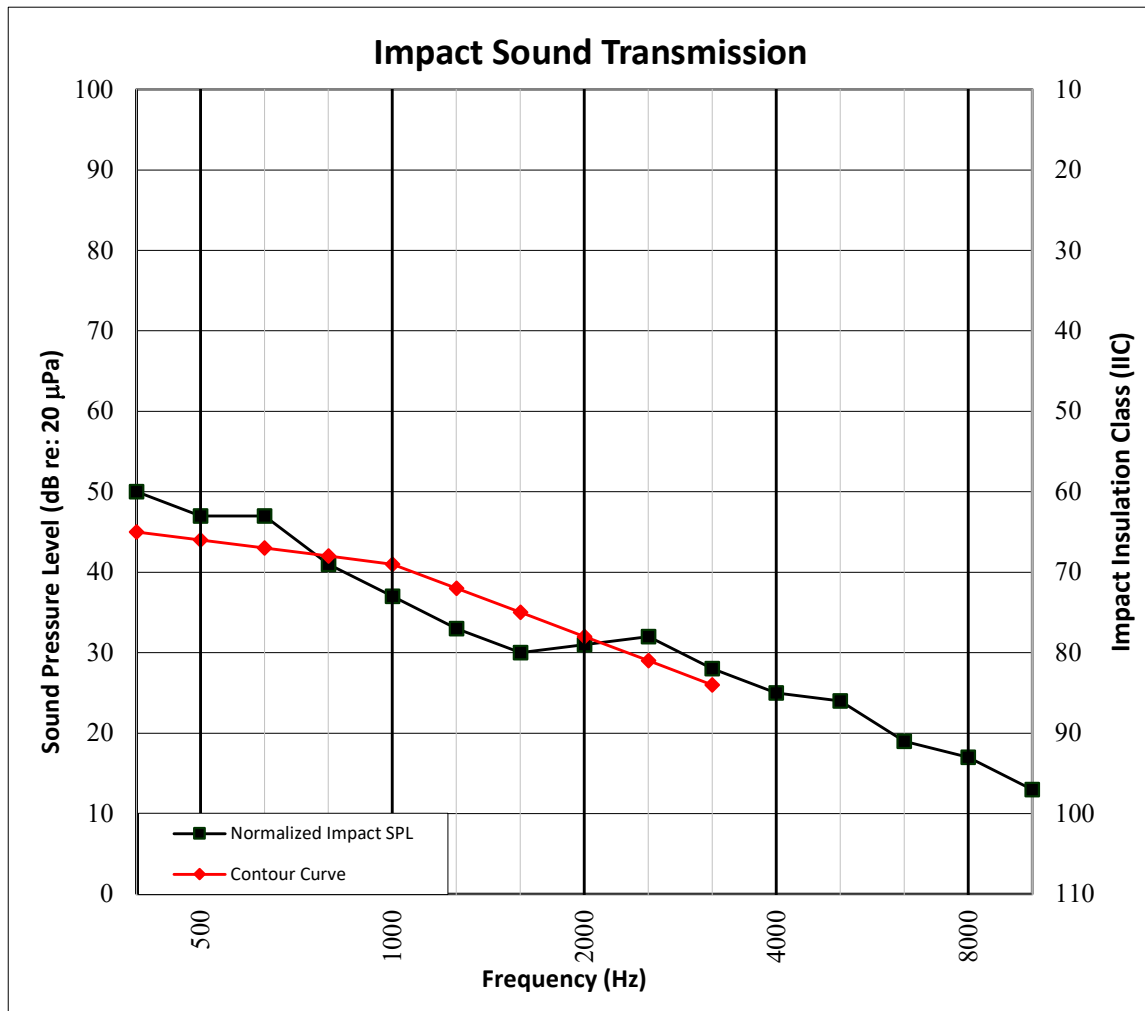
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SECTION 15

TEST RESULTS - HIGH-FREQUENCY IMPACT SOUND TRANSMISSION GRAPH



TEST DATE	8/5/2024				
DATA FILE NO.	R5380.40				
CLIENT	Acoustical Surfaces, Inc.				
DESCRIPTION	8.4 mm Shaw Engineered Wood, 12 mm ACOUSTIK Rubber Underlayment, 19.1 mm USG Levelrock® 2500 Floor Underlayment, 18.8 mm Oriented Strand Board Sheathing, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 235 mm 2x10 Dimensional Lumber, 12.7 mm ClarkDietrich RC Deluxe™ Resilient Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	25.6°C	Minimum Temp.	25.6°C
TECHNICIAN	MAU	Max. Humidity	74%	Min. Humidity	73%



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SECTION 16

PHOTOGRAPHS



Photo No. 1
Source Room View of Test Specimen Installation

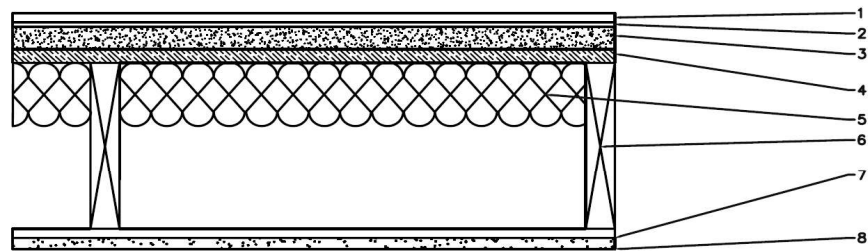


Photo No. 2
Receive Room View of Test Specimen Installation

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SECTION 17**DRAWING**

- 1-Floor Topping
- 2-Underlayment
- 3-Subfloor Topping
- 4-Subfloor
- 5-Insulation
- 6-Joist
- 7-Ceiling Isolation
- 8-Ceiling



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SECTION 18

REVISION LOG

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