

ACOUSTIK ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK

ASTM E90, ASTM E492, AND ASTM E2179 TESTING ON ENGINEERED
WOOD OVER 2MM ACOUSTIK ACOUSTICAL RUBBER UNDERLAYMENT

SPECIMEN TYPE

Concrete Slab - 152 mm

REPORT NUMBER

N1962.02-113-11-R0

TEST DATE

01/06/22

ISSUE DATE

01/19/22

RECORD RETENTION END

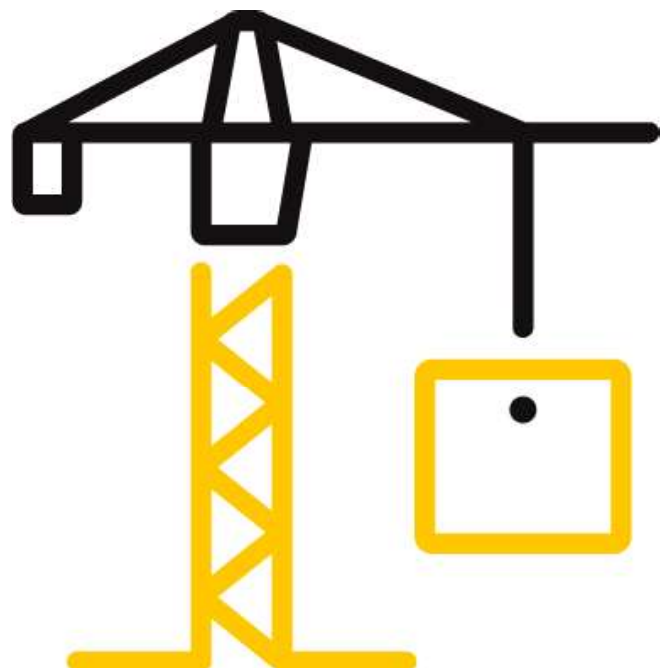
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PAGES

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TEST REPORT FOR ACOUSTIK

Report No.: N1962.02-113-11-R0

Date: 01/19/22

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, ASTM E492, AND ASTM E2179 on Engineered Wood over 2 mm ACOUSTIK Acoustical 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.	N1962.02
SERIES/MODEL:	Engineered Wood over 2mm ACOUSTIK Acoustical Rubber Underlayment
STC	51
IIC	55
ΔIIC	23
HIIC	56
ΔHIIC	27

COMPLETED BY: Corey S. Kohler
Technician - Acoustical
TITLE: Testing
SIGNATURE: 
Digitally Signed by: Corey Kohler
DATE: 01/19/22

COMPLETED BY: Daniel B. Mohler
Project Lead - Acoustical
TITLE: Testing
SIGNATURE: 
Digitally Signed for: Daniel Mohler by Jordan Strybos
DATE: 01/19/22

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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 E413-16, *Classification for Rating Sound Insulation*

ASTM E492-09(2016)e1, *Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine*

ASTM E2179-21, *Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors*

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 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 (Concrete Slab - 152 mm) 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 4128.4 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	INT02572	05/21	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02574	05/21	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02575	05/21	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02576	05/21	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02577	05/21	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02578	05/21	*
2-Channel Analog Output	National Instruments	NI 9260	2-Channel Analog Input	INT02573	05/21	*
Microphone Calibrator	Norsonic	34093	Acoustical Calibrator	65105	10/21	
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63745	09/21	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63747	07/21	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64340	10/21	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	INT01089	02/21	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	INT00652	02/21	
Receive Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63810	10/21	
				63811	10/21	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	65969	04/21	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63742	03/21	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63741	07/21	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63740	04/21	
Source Room Microphone	PCB Electronics	378C20	Microphone and Preamplifier	63739	04/21	
Source Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63812	10/21	
Tapping Machine	Norsonic	Nor277	Tapping Machine	INT00936	02/21	

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

VT RECEIVE ROOM VOLUME	158.86 m ³
VT SOURCE ROOM VOLUME	190 m ³

SECTION 6 LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Morgan S. J. Kennedy	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 through 15.

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.

The delta impact insulation test was conducted in accordance with ASTM E2179 test method. In addition to the impact sound transmission test, two sound pressure level measurements with the tapping machine operating at each position specified by ASTM E492 with only the concrete slab installed 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), HIIC (High-Frequency Impact Insulation Class), and Δ IIC (Delta Impact Insulation Class) ratings were calculated in accordance with ASTM E413, ASTM E989, ASTM E3222, and ASTM E2179, respectively.

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SECTION 9

TEST SPECIMEN DESCRIPTION

MATERIAL	DIMENSIONS (mm)	THICKNESS (mm)	MANUFACTURER AND SERIES	QUANTITY	AVERAGE WEIGHT
Flooring	127 by Varied	9.0	Engineered Wood	10.98 m ²	7.67 kg/m ²
	Note: Loose laid				
Acoustical Rubber Underlayment	3023 by 1219.2	2.0	ACOUSTIK	10.98 m ²	2.15 kg/m ²
	Note: Loose laid				
Concrete Slab	3023 by 3632	152.4	5000 PSI	10.98 m ²	366.18 kg/m ²
	Note: Installed in a test frame flush to the source room. Mats of #5 reinforcing bars were placed 25.4 mm from both the top and bottom of the slab, with bars spaced on 305 mm centers in both directions. No noticeable shrinkage or cracking was visible on the specimen.				

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SECTION 10

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS



TEST DATE	1/6/2022				
DATA FILE NO.	N1962.02				
CLIENT	Acoustical Surfaces, Inc.				
DESCRIPTION	9mm Engineered Wood Flooring, 2mm ACOUSTIK Rubber Underlayment, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Receive Temp.	15.4°C	Source Temp.	16°C
TECHNICIAN	MSJK	Receive Humidity	56%	Source Humidity	56%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
50	37	24.1	99	62	36	4.0	-
63	37.7	17.0	98	63	35	4.3	-
80	33.1	15.1	95	62	33	2.5	-
100	26.5	8.3	96	59	39	2.1	-
125	28.8	7.7	101	62	41	2.0	0
160	24.0	8.0	99	62	39	1.0	0
200	18.2	8.6	98	60	39	1.1	2
250	16.4	9.1	102	60	44	1.0	0
315	18.0	9.4	107	64	45	0.7	2
400	12.7	8.3	108	66	43	1.3	7
500	13.9	8.2	105	63	43	1.1	8
630	17.5	8.1	106	60	47	0.5	5
800	15.4	8.2	106	52	55	0.8	0
1000	15.0	8.1	106	47	60	0.6	0
1250	12.8	8.4	105	43	63	0.5	0
1600	9.1	8.8	104	41	64	0.4	0
2000	8.1	9.8	105	39	67	0.4	0
2500	7.6	10.7	101	34	69	0.5	0
3150	7.6	11.9	102	31	71	0.9	0
4000	8.2	13.6	102	29	72	1.0	0
5000	9.0	15.7	100	24	76	1.2	-
6300	9.7	19.5	98	17	79	1.5	-
8000	10.4	25.1	98	14	81	1.0	-
10000	11.0	25.1	96	11	82	0.9	-
STC Rating	51	(Sound Transmission Class)			Sum of Deficiencies	24	

- 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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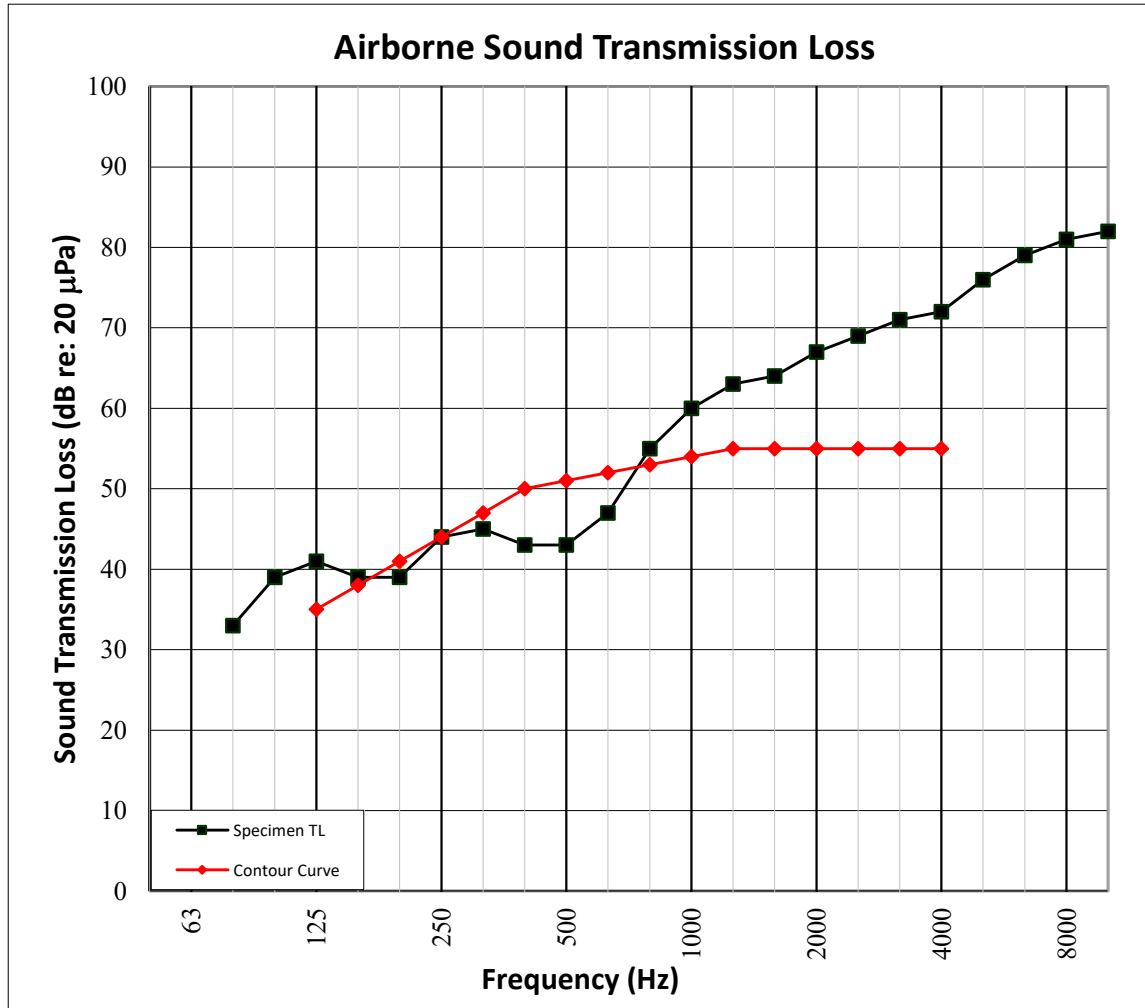
Date: 01/19/22

SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH



TEST DATE	1/6/2022				
DATA FILE NO.	N1962.02				
CLIENT	Acoustical Surfaces, Inc.				
DESCRIPTION	9mm Engineered Wood Flooring, 2mm ACOUSTIK Rubber Underlayment, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Receive Temp.	15.4°C	Source Temp.	16°C
TECHNICIAN	MSJK	Receive Humidity	56%	Source Humidity	56%



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SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION



TEST DATE	1/6/2022				
DATA FILE NO.	N1962.02				
CLIENT	Acoustical Surfaces, Inc.				
DESCRIPTION	9mm Engineered Wood Flooring, 2mm ACOUSTIK Rubber Underlayment, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	15.5°C	Minimum Temp.	15.2°C
TECHNICIAN	MSJK	Max. Humidity	57%	Min. Humidity	55%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	NORMALIZED IMPACT SPL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	35.9	13.7	57	2.5	-
100	26.4	9.8	54	1.1	0
125	27.2	7.6	57	1.2	0
160	24.4	7.9	60	0.9	3
200	19.6	9.1	63	0.5	6
250	15.4	9.5	61	0.6	4
315	18.5	9.3	62	0.7	5
400	13.9	8.3	61	0.5	5
500	15.7	8.3	59	0.5	4
630	21.1	7.9	58	0.5	4
800	16.8	8.0	53	0.7	0
1000	15.4	8.1	50	0.5	0
1250	13.5	8.5	42	0.5	0
1600	9.3	8.7	36	0.3	0
2000	7.8	9.8	31	0.6	0
2500	7.6	10.7	25	0.6	0
3150	7.6	11.8	16	0.9	0
4000	8.2	13.5	12	1.1	-
5000	9.0	15.8	11	0.8	-
6300	9.7	19.5	11	0.9	-
8000	10.4	25.0	13	1.0	-
10000	11.0	25.0	13	1.1	-
IIC Rating	55	(Impact Insulation Class)		Sum of Deficiencies	31

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

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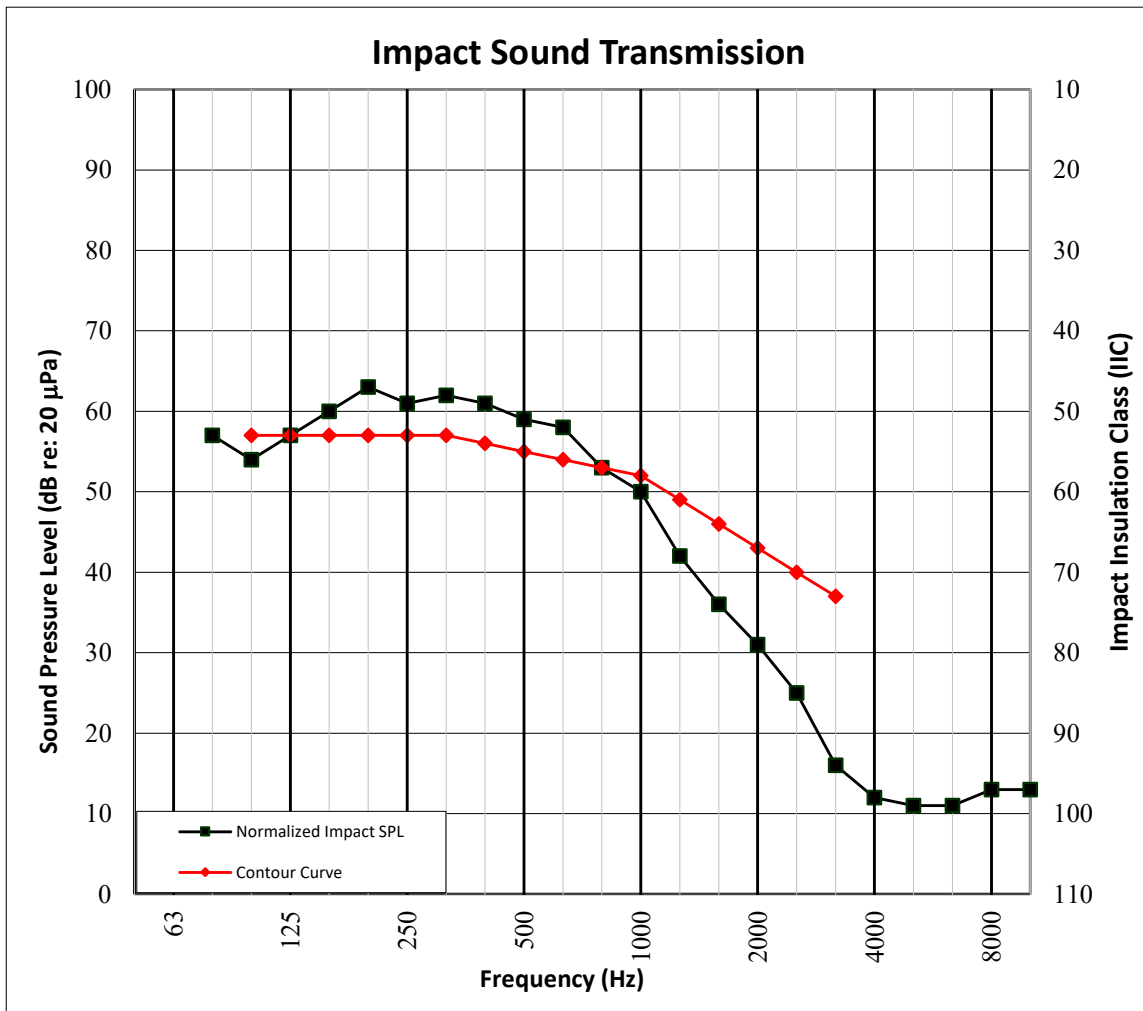
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SECTION 13

TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH



TEST DATE	1/6/2022				
DATA FILE NO.	N1962.02				
CLIENT	Acoustical Surfaces, Inc.				
DESCRIPTION	9mm Engineered Wood Flooring, 2mm ACOUSTIK Rubber Underlayment, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	15.5°C	Minimum Temp.	15.2°C
TECHNICIAN	MSJK	Max. Humidity	57%	Min. Humidity	55%



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SECTION 14

TEST RESULTS - HIGH-FREQUENCY IMPACT SOUND TRANSMISSION



TEST DATE	1/6/2022				
DATA FILE NO.	N1962.02				
CLIENT	Acoustical Surfaces, Inc.				
DESCRIPTION	9mm Engineered Wood Flooring, 2mm ACOUSTIK Rubber Underlayment, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	15.5°C	Minimum Temp.	15.2°C
TECHNICIAN	MSJK	Max. Humidity	57%	Min. Humidity	55%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	NORMALIZED IMPACT SPL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
400	13.9	8.3	61	0.5	5.9
500	15.7	8.3	59	0.5	4.6
630	21.1	7.9	58	0.5	5.3
800	16.8	8.0	53	0.7	1.1
1000	15.4	8.1	50	0.5	0.0
1250	13.5	8.5	42	0.5	0.0
1600	9.3	8.7	36	0.3	0.0
2000	7.8	9.8	31	0.6	0.0
2500	7.6	10.7	25	0.6	0.0
3150	7.6	11.8	16	0.9	0.0
HIIC Rating	56	(High-Frequency Impact Insulation Class)		Sum of Deficiencies	17.0

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

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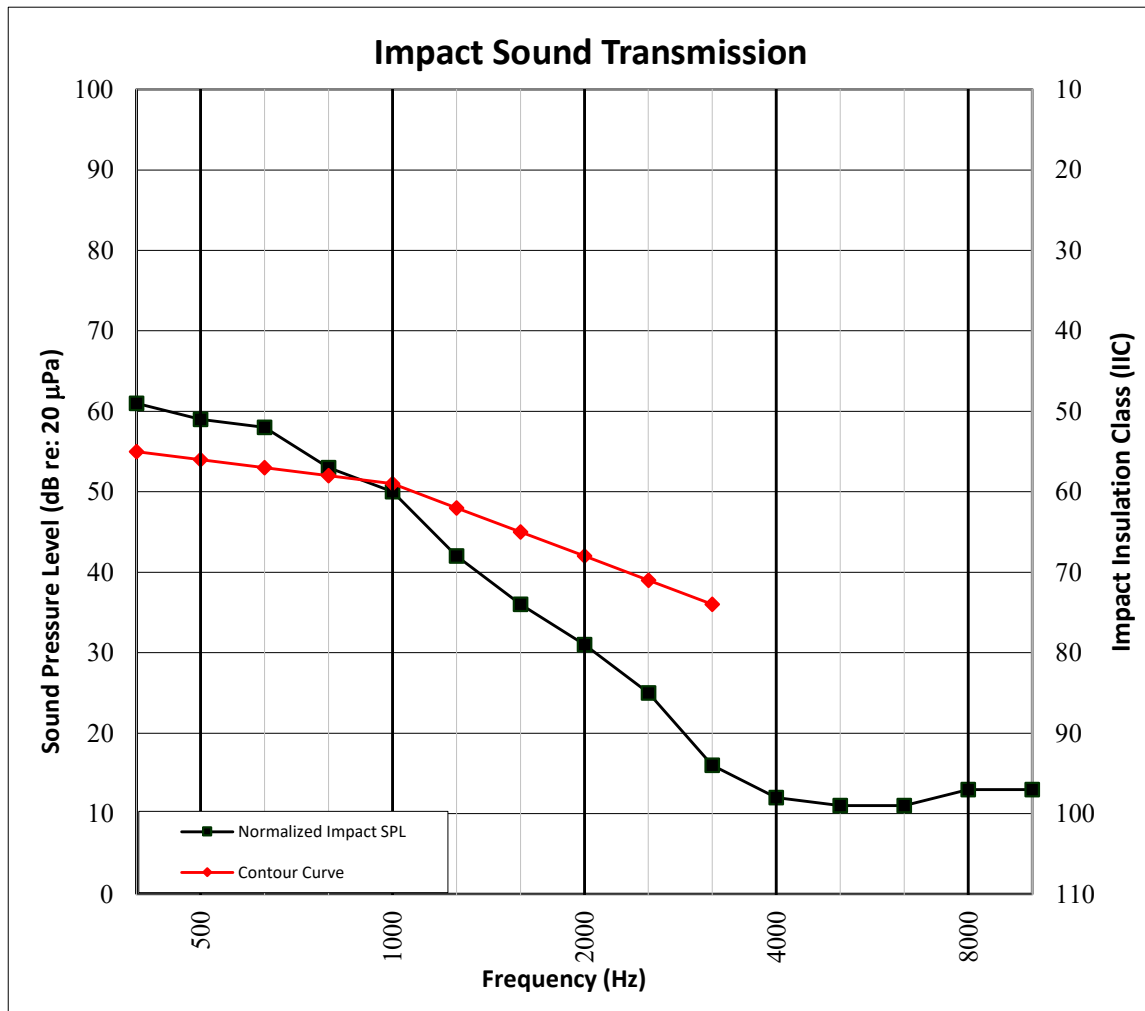
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SECTION 15

TEST RESULTS -HIGH-FREQUENCY IMPACT SOUND TRANSMISSION GRAPH



TEST DATE	1/6/2022				
DATA FILE NO.	N1962.02				
CLIENT	Acoustical Surfaces, Inc.				
DESCRIPTION	9mm Engineered Wood Flooring, 2mm ACOUSTIK Rubber Underlayment, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	15.5°C	Minimum Temp.	15.2°C
TECHNICIAN	MSJK	Max. Humidity	57%	Min. Humidity	55%



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SECTION 16

TEST RESULTS - DELTA IMPACT INSULATION



TEST DATE	1/6/2022				
DATA FILE NO.	N1962.02				
CLIENT	Acoustical Surfaces, Inc.				
DESCRIPTION	9mm Engineered Wood Flooring, 2mm ACOUSTIK Rubber Underlayment, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	15.5°C	Minimum Temp.	15.2°C
TECHNICIAN	MSJK	Max. Humidity	57%	Min. Humidity	55%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	NORMALIZED IMPACT SPL BARE (dB)	95% CONF LIMIT	NORMALIZED IMPACT SPL SPEC (dB)	95% CONF LIMIT	RESULT ARRAY L _{ref,c}	NUMBER OF DEFICIENCIES
100	26.4	9.8	55.8	1.1	54.3	1.3	65.0	4
125	27.2	7.6	59.2	1.5	56.7	1.5	65.0	4
160	24.4	7.9	63.5	1.0	60.2	1.1	65.0	4
200	19.6	9.1	66.7	0.6	63.5	0.7	65.0	4
250	15.4	9.5	66.0	0.9	61.3	0.7	64.0	3
315	18.5	9.3	68.7	0.9	62.3	0.9	63.0	2
400	13.9	8.3	68.1	0.8	60.9	0.6	63.0	3
500	15.7	8.3	68.5	0.6	58.6	0.6	61.0	2
630	21.1	7.9	71.3	0.7	58.3	0.6	58.0	0
800	16.8	8.0	70.9	0.9	53.1	0.8	54.0	0
1000	15.4	8.1	72.0	0.7	50.1	0.7	50.0	0
1250	13.5	8.5	71.9	0.5	42.4	0.6	43.0	0
1600	9.3	8.7	72.0	0.4	35.8	0.4	36.0	0
2000	7.8	9.8	72.2	0.8	30.7	0.7	30.0	0
2500	7.6	10.7	71.4	0.7	25.4	0.7	26.0	0
3150	7.6	11.8	70.7	1.1	15.8	1.1	17.0	0
ΔIIC Rating	23	(Delta Impact Insulation Class)				Sum of Deficiencies	26	
ΔHIIC Rating	27	(Delta High-Frequency Impact Insulation Class)				Sum of Deficiencies	18	

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

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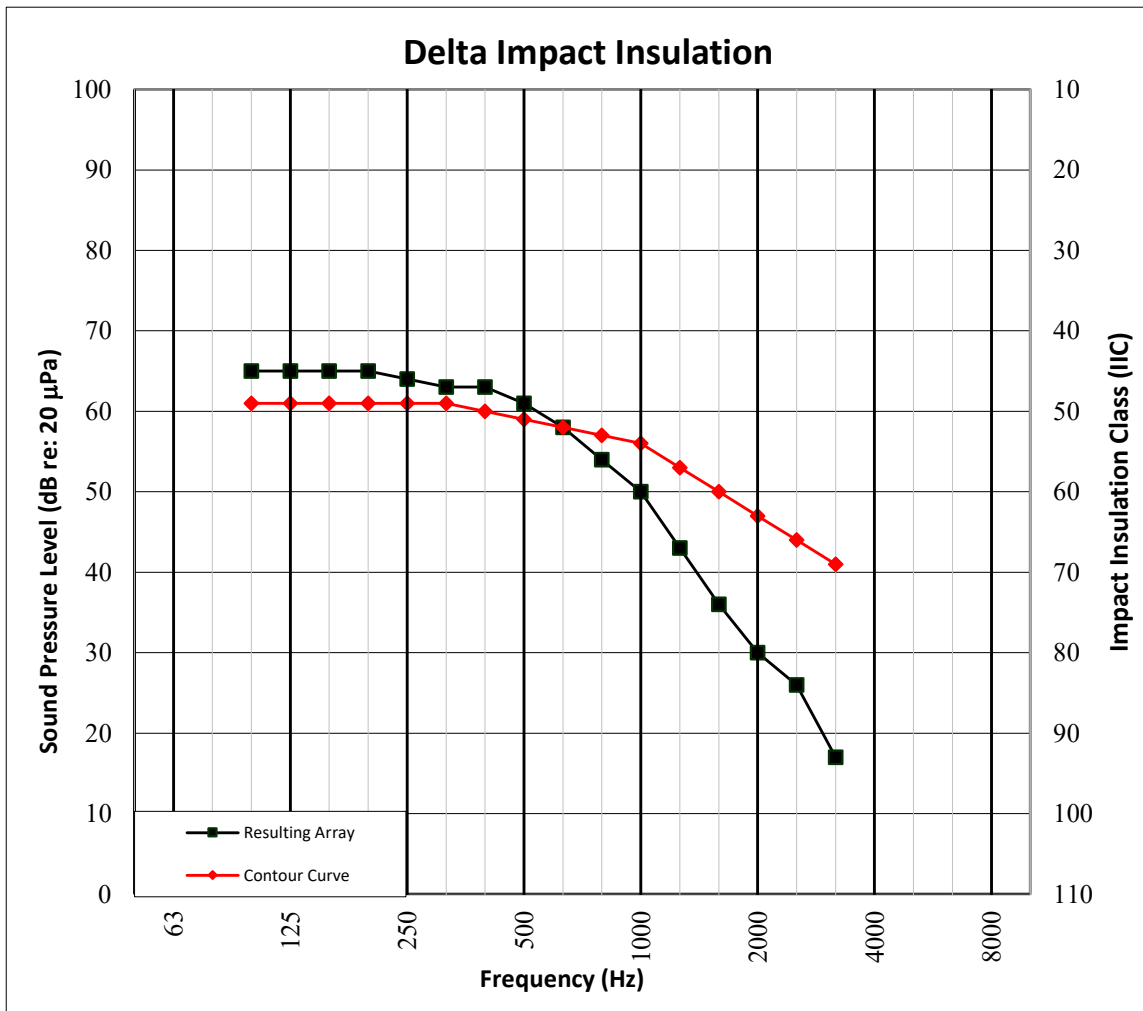
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SECTION 17

TEST RESULTS - DELTA IMPACT INSULATION GRAPH



TEST DATE	1/6/2022				
DATA FILE NO.	N1962.02				
CLIENT	Acoustical Surfaces, Inc.				
DESCRIPTION	9mm Engineered Wood Flooring, 2mm ACOUSTIK Rubber Underlayment, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	15.5°C	Minimum Temp.	15.2°C
TECHNICIAN	MSJK	Max. Humidity	57%	Min. Humidity	55%



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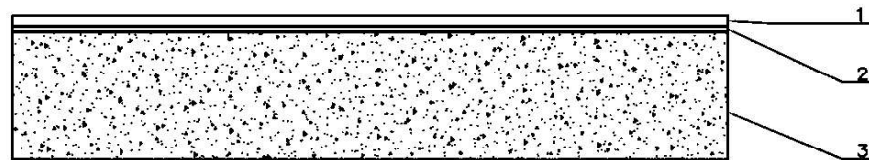
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SECTION 18**PHOTOGRAPHS****Photo No. 1****Source Room View of Test Specimen Installation****Photo No. 2****Receive Room View of Test Specimen Installation**

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SECTION 19**DRAWING**

- 1-Floor Topping
- 2-Underlayment
- 3-Concrete Slab



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SECTION 20

REVISION LOG

REVISION #	DATE	PAGES	DESCRIPTION
R0	01/19/22	N/A	Original Report Issue