

KÄHRS INTERNATIONAL ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK

ASTM E90 AND ASTM E492 TESTING ON 13 MM KÄHRS OAK LECCO WOOD FLOORING
OVER QUIETSTIDE 2.0 SOUND CONTROL UNDERLAYMENT

SPECIMEN TYPE

Concrete Slab - 203 mm

REPORT NUMBER

M6749.02-113-11-R1

TEST DATE

08/09/21

ISSUE DATE

10/11/21

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11/15/21

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PAGES

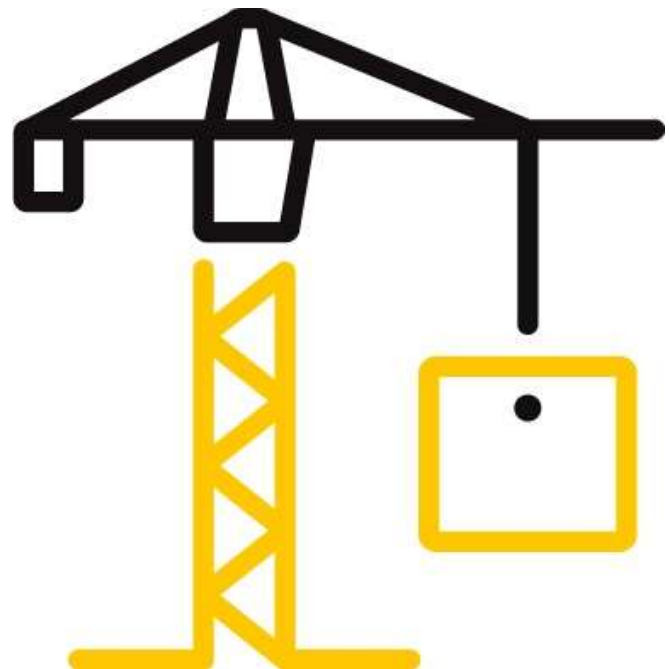
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Report No.: M6749.02-113-11-R1

Date: 11/15/21

REPORT ISSUED TO

KÄHRS INTERNATIONAL

317 North Lake Boulevard, Suite 1016
Altamonte Springs, Florida 32714

SECTION 1

SCOPE


Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted by Kährs International to perform testing in accordance with ASTM E90 AND ASTM E492 on 13 mm Kährs Oak Lecco Wood Flooring over QUIETSTIDE 2.0 Sound Control 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.	M6749.02
SERIES/MODEL:	13 mm Kährs Oak Lecco Wood Flooring over QUIETSTIDE 2.0 Sound Control Underlayment
STC	55
IIC	56
HIIC	58

COMPLETED BY: Corey S. Kohler
Technician - Acoustical
TITLE: Testing
SIGNATURE: 
Digitally Signed by: Corey Kohler
DATE: 11/15/21

COMPLETED BY: Daniel B. Mohler
Project Lead - Acoustical
TITLE: Testing
SIGNATURE: 
Digitally Signed by: Daniel Mohler
DATE: 11/15/21

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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 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 - 203 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 5857 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	
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	63763-1	10/20	*
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	63763-4	10/20	*
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	65124	02/21	*
Microphone Calibrator	Norsonic	1251	Acoustical Calibrator	65105	09/20	
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	64340	11/20	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	65617	09/20	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	65968	01/21	
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	10/20	
				63811	10/20	
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	63747	09/20	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63745	09/20	
Source Room Microphone	PCB Electronics	378C20	Microphone and Preamplifier	63744	09/20	
Source Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63812	10/20	
Tapping Machine	Norsonic	Nor277	Tapping Machine	INT00936	01/21	

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

VT RECEIVE ROOM VOLUME	158.34 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
Wood Flooring	2423 by 200	13.0	Kährs International Oak Lecco	10.98 m ²	6.79 kg/m ²
	Note: Loose laid				
Sound Control Rubber Underlayment	3023 by 1219.2	2.0	QUIETSTRIDE 2.0	10.98 m ²	1.9 kg/m ²
	Note: Loose laid				
Concrete Slab	3023 by 3632	203.2	5000 PSI	10.98 m ²	524.71 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	8/9/2021				
DATA FILE NO.	M6749.02				
CLIENT	Kährs International				
DESCRIPTION	13 mm Kährs International Oak Lecco Wood Flooring, 2 mm QUIETSTRIDE 2.0 Sound Control Rubber Underlayment, 203.2 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Receive Temp.	22.5°C	Source Temp.	22.7°C
TECHNICIAN	MAU	Receive Humidity	71%	Source Humidity	71%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
50	32.3	28.6	101	65	33	3.4	-
63	31.2	29.1	98	60	34	4.0	-
80	37.7	15.1	98	62	36	3.1	-
100	26.6	11.3	94	61	34	2.8	-
125	23.9	10.7	96	56	41	1.6	0
160	23.7	9.5	95	58	39	1.2	3
200	20.6	11.5	96	52	45	1.4	0
250	17.3	11.1	99	56	44	1.1	4
315	19.4	11.2	103	57	46	1.3	5
400	16.5	10.0	103	54	49	1.0	5
500	16.0	9.1	101	52	50	0.5	5
630	17.1	8.9	103	50	54	0.9	2
800	16.2	9.0	102	47	55	0.6	2
1000	14.1	9.0	102	42	61	0.7	0
1250	12.5	9.1	103	40	64	0.6	0
1600	17.5	9.4	103	39	65	0.5	0
2000	12.7	10.2	102	37	67	0.5	0
2500	9.0	11.0	101	33	68	0.5	0
3150	7.2	11.9	101	31	70	0.6	0
4000	7.3	13.0	103	30	73	0.8	0
5000	7.7	14.7	103	27	76	0.5	-
6300	7.9	17.4	97	17	79	0.9	-
8000	8.2	22.0	98	14	82	1.1	-
10000	8.3	22.0	93	8	83	0.8	-
STC Rating	55	<i>(Sound Transmission Class)</i>			Sum of Deficiencies	26	

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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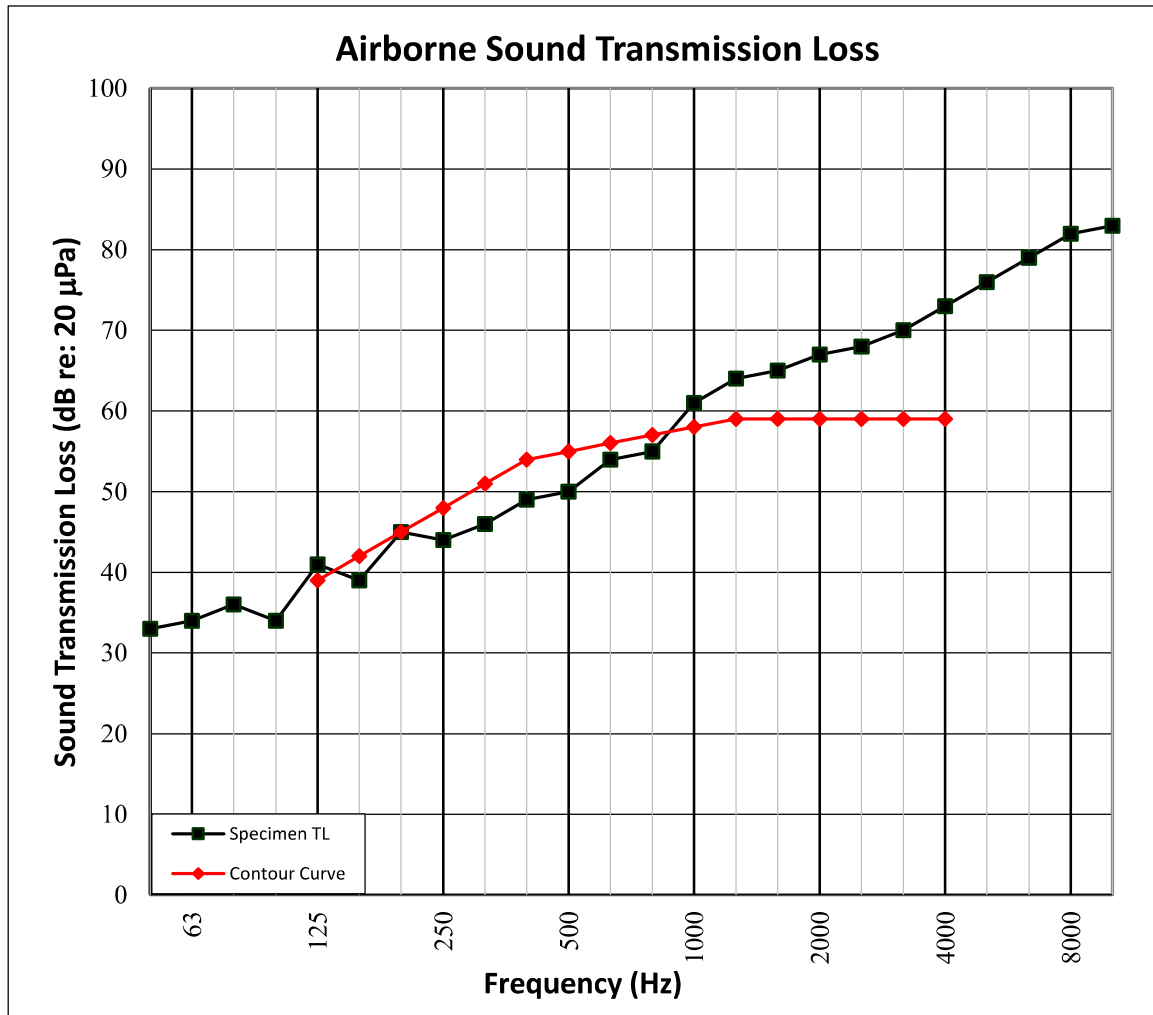
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SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH



TEST DATE	8/9/2021				
DATA FILE NO.	M6749.02				
CLIENT	Kährs International				
DESCRIPTION	13 mm Kährs International Oak Lecco Wood Flooring, 2 mm QUIETSTRIDE 2.0 Sound Control Rubber Underlayment, 203.2 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Receive Temp.	22.5°C	Source Temp.	22.7°C
TECHNICIAN	MAU	Receive Humidity	71%	Source Humidity	71%



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SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION



TEST DATE	8/9/2021				
DATA FILE NO.	M6749.02				
CLIENT	Kährs International				
DESCRIPTION	13 mm Kährs International Oak Lecco Wood Flooring, 2 mm QUIETSTRIDE 2.0 Sound Control Rubber Underlayment, 203.2 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	22.5°C	Minimum Temp.	22.4°C
TECHNICIAN	MAU	Max. Humidity	71%	Min. Humidity	71%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	NORMALIZED IMPACT SPL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
50	36.4	31.6	59	2.0	-
63	33.5	27.8	53	2.6	-
80	31.7	15.6	51	2.0	-
100	29.4	11.5	52	1.1	0
125	25.5	10.6	56	1.2	0
160	24.1	9.2	58	1.2	2
200	20.9	11.2	61	0.9	5
250	18.2	10.7	62	0.9	6
315	20.0	10.8	62	1.1	6
400	21.1	10.1	59	0.8	4
500	20.7	9.2	59	0.6	5
630	21.6	8.9	53	0.5	0
800	21.1	8.9	53	0.7	1
1000	22.0	8.9	47	0.6	0
1250	20.9	9.1	41	0.4	0
1600	20.9	9.5	36	0.6	0
2000	20.7	10.3	30	0.8	0
2500	17.9	11.0	22	1.0	0
3150	15.8	11.9	18	1.1	0
4000	10.2	13.1	12	0.8	-
5000	7.7	14.7	8	0.4	-
6300	7.2	17.4	8	0.2	-
8000	7.4	21.9	9	0.2	-
10000	7.7	21.9	9	0.3	-
IIC Rating	56	<i>(Impact Insulation Class)</i>		Sum of Deficiencies	29

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

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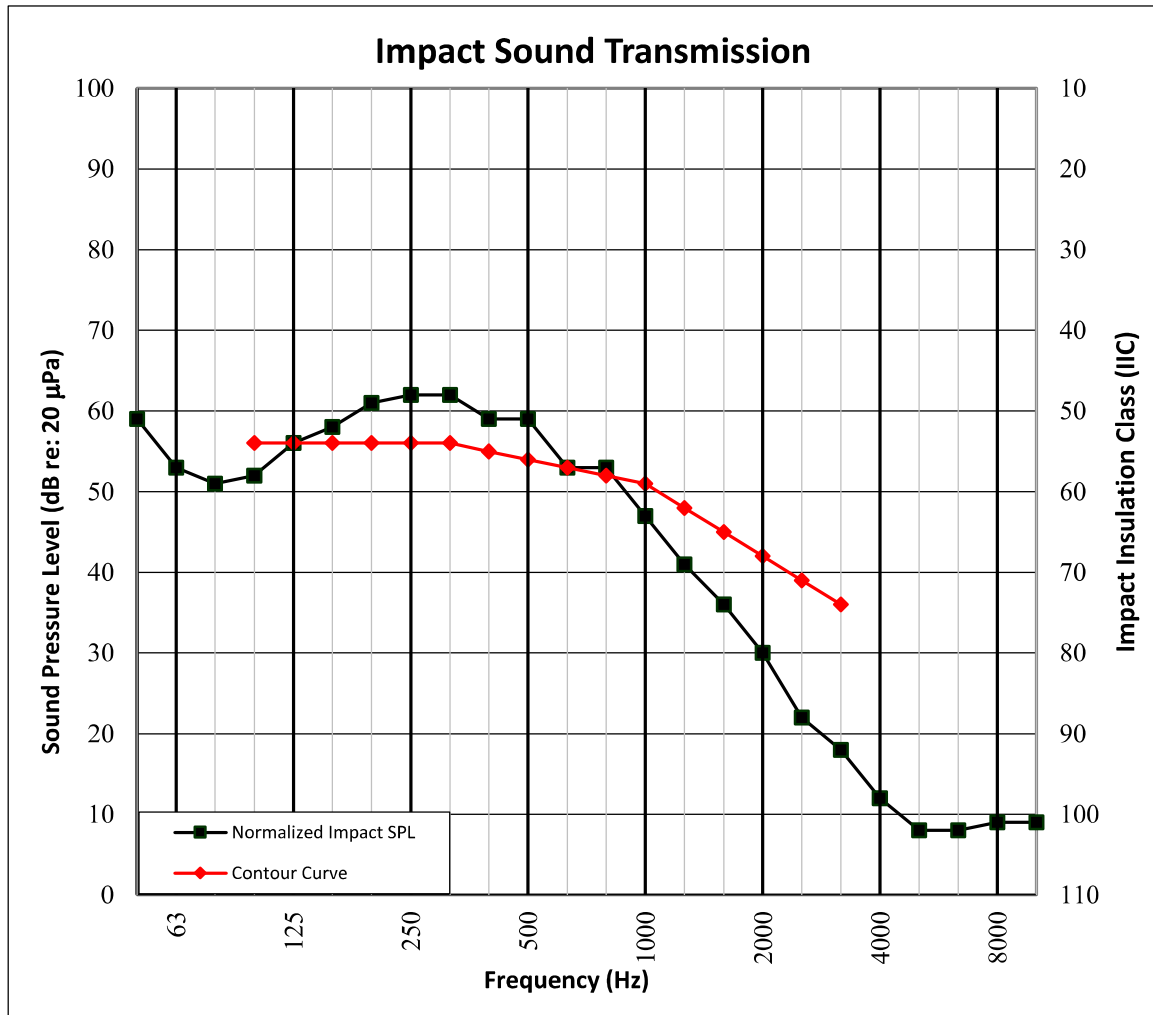
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SECTION 13

TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH



TEST DATE	8/9/2021				
DATA FILE NO.	M6749.02				
CLIENT	Kährs International				
DESCRIPTION	13 mm Kährs International Oak Lecco Wood Flooring, 2 mm QUIETSTRIDE 2.0 Sound Control Rubber Underlayment, 203.2 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	22.5°C	Minimum Temp.	22.4°C
TECHNICIAN	MAU	Max. Humidity	71%	Min. Humidity	71%



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SECTION 14

TEST RESULTS - HIGH-FREQUENCY IMPACT SOUND TRANSMISSION



TEST DATE	8/9/2021				
DATA FILE NO.	M6749.02				
CLIENT	Kährs International				
DESCRIPTION	13 mm Kährs International Oak Lecco Wood Flooring, 2 mm QUIETSTRIDE 2.0 Sound Control Rubber Underlayment, 203.2 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	22.5°C	Minimum Temp.	22.4°C
TECHNICIAN	MAU	Max. Humidity	71%	Min. Humidity	71%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	NORMALIZED IMPACT SPL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
400	21.1	10.1	59	0.8	6.0
500	20.7	9.2	59	0.6	7.3
630	21.6	8.9	53	0.5	2.5
800	21.1	8.9	53	0.7	3.0
1000	22.0	8.9	47	0.6	0.0
1250	20.9	9.1	41	0.4	0.0
1600	20.9	9.5	36	0.6	0.0
2000	20.7	10.3	30	0.8	0.0
2500	17.9	11.0	22	1.0	0.0
3150	15.8	11.9	18	1.1	0.0
HIIC Rating	58	<i>(High-Frequency Impact Insulation Class)</i>		Sum of Deficiencies	18.7

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

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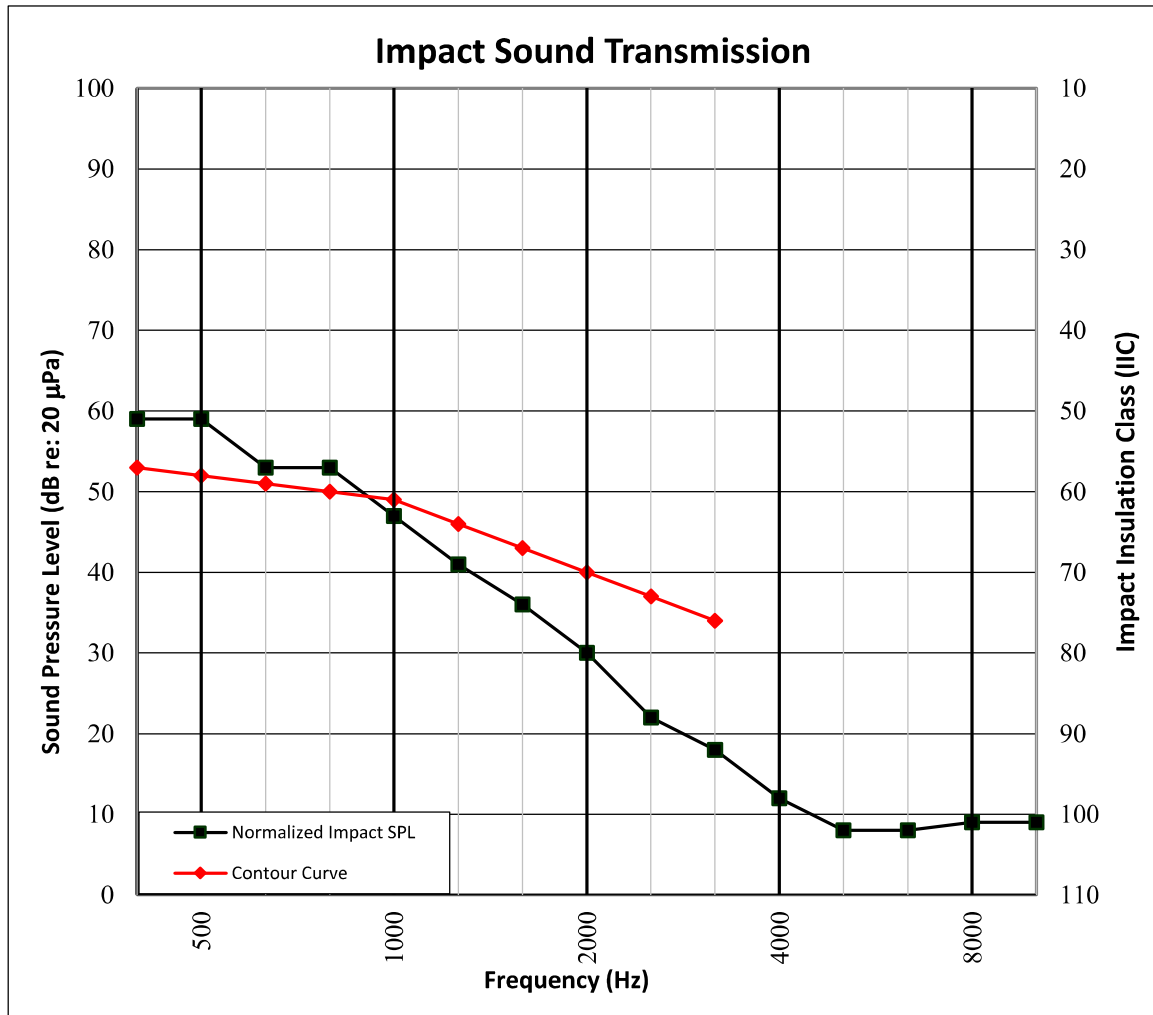
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SECTION 15

TEST RESULTS -HIGH-FREQUENCY IMPACT SOUND TRANSMISSION GRAPH



TEST DATE	8/9/2021				
DATA FILE NO.	M6749.02				
CLIENT	Kährs International				
DESCRIPTION	13 mm Kährs International Oak Lecco Wood Flooring, 2 mm QUIETSTRIDE 2.0 Sound Control Rubber Underlayment, 203.2 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	22.5°C	Minimum Temp.	22.4°C
TECHNICIAN	MAU	Max. Humidity	71%	Min. Humidity	71%



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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

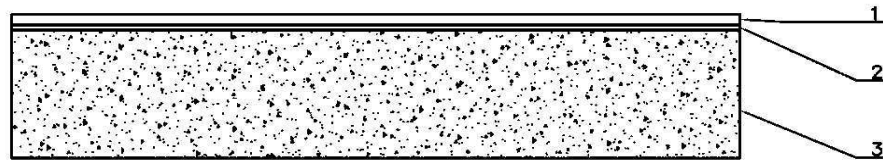
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SECTION 17

DRAWING



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

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SECTION 18

REVISION LOG

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R0	10/11/21	N/A	Original Report Issue
R1	11/15/21	Page 2	Updated company address