

# KÄHRS INTERNATIONAL ACOUSTICAL PERFORMANCE TEST REPORT

## SCOPE OF WORK

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

## SPECIMEN TYPE

Concrete Slab - 203 mm

## REPORT NUMBER

M4769.03-113-11-R1

## TEST DATE

08/09/21

## ISSUE DATE

10/11/21

## REVISED DATE

11/15/21

## RECORD RETENTION END

08/09/25

## PAGES

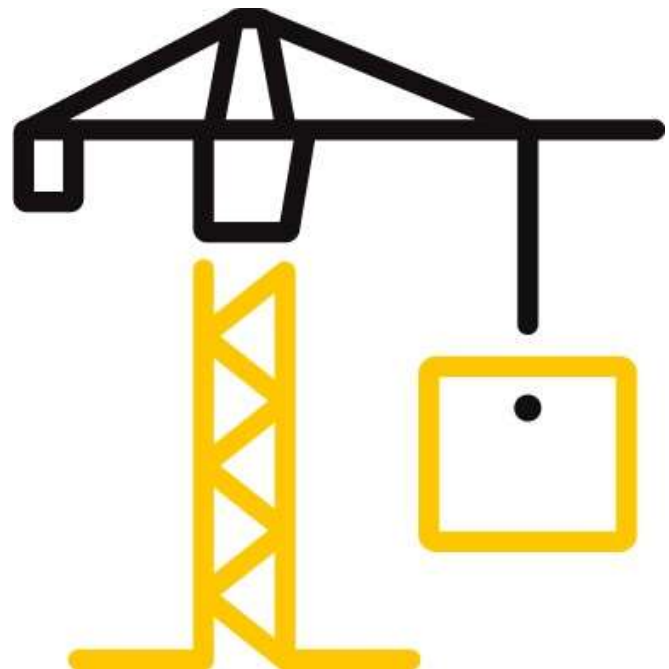
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## DOCUMENT CONTROL

ATI 00629 (03/21/18)

RTTDS-R-AMER-Test-2844

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## TEST REPORT FOR KÄHRS INTERNATIONAL

Report No.: M4769.03-113-11-R1

Date: 11/15/21

### REPORT ISSUED TO

#### KÄHRS INTERNATIONAL

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

### SECTION 1

#### SCOPE

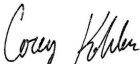
Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted by Kährs International to perform testing in accordance with ASTM E90 AND ASTM E492 on 13 mm Kährs Oak Carbon Wood Flooring over QUIETSTIDE 2.0 Sound Control Underlayment. Results obtained are 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

<b>DATA FILE NO.</b>	M4769.03
<b>SERIES/MODEL:</b>	13 mm Kährs Oak Carbon Wood Flooring over QUIETSTIDE 2.0 Sound Control Underlayment
<b>STC</b>	55
<b>IIC</b>	56
<b>HIIC</b>	59

**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 5871.7 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.

<b>VT RECEIVE ROOM VOLUME</b>	158.34 m <sup>3</sup>
<b>VT SOURCE ROOM VOLUME</b>	190 m <sup>3</sup>

**SECTION 6  
LIST OF OFFICIAL OBSERVERS**

NAME	COMPANY
Corey S. Kohler	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	1860 by 127	13.0	Kährs Oak Carbon	10.98 m <sup>2</sup>	8.1 kg/m <sup>2</sup>
	Note: Loose laid				
Sound Control Rubber Underlayment	3023 by 1219.2	2.0	QUIETSTRIDE 2.0	10.98 m <sup>2</sup>	1.9 kg/m <sup>2</sup>
	Note: Loose laid				
Concrete Slab	3023 by 3632	203.2	5000 PSI	10.98 m <sup>2</sup>	524.71 kg/m <sup>2</sup>
	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



<b>TEST DATE</b>	8/9/2021				
<b>DATA FILE NO.</b>	M4769.03				
<b>CLIENT</b>	Kährs International				
<b>DESCRIPTION</b>	13 mm Kährs Oak Carbon Engineered Wood, 2 mm QUIETSTRIDE 2.0 Sound Control Rubber Underlayment, 203.2 mm 5000 PSI Concrete Slab				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Receive Temp.</b>	22.4°C	<b>Source Temp.</b>	22.8°C
<b>TECHNICIAN</b>	CSK	<b>Receive Humidity</b>	71%	<b>Source Humidity</b>	71%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m <sup>2</sup>	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
50	36.1	25.3	100	64	33	3.3	-
63	34.6	26.9	98	61	34	3.9	-
80	35.4	14.4	96	62	35	2.4	-
100	30.0	12.3	94	60	34	2.4	-
125	30.2	11.1	96	56	41	1.5	0
160	26.9	10.3	95	58	38	1.4	4
200	23.3	11.5	97	53	44	1.2	1
250	21.6	10.7	100	55	45	0.9	3
315	22.1	11.2	102	56	46	0.8	5
400	17.4	9.8	102	54	49	1.3	5
500	18.7	9.0	101	54	48	0.6	7
630	21.3	8.9	103	50	54	0.8	2
800	19.8	8.8	102	46	57	0.5	0
1000	17.6	8.9	102	42	60	0.7	0
1250	14.6	9.2	103	41	63	0.5	0
1600	13.9	9.5	102	39	64	0.5	0
2000	12.3	10.2	102	36	67	0.3	0
2500	9.4	10.9	101	33	69	0.3	0
3150	7.7	11.9	101	31	71	0.8	0
4000	7.3	12.9	103	29	73	0.6	0
5000	7.4	14.6	103	26	76	0.6	-
6300	7.2	17.4	97	17	79	0.8	-
8000	7.5	21.8	97	13	82	1.0	-
10000	8.0	21.8	92	8	83	0.8	-
<b>STC Rating</b>	<b>55</b>	<i>(Sound Transmission Class)</i>			<b>Sum of Deficiencies</b>	<b>27</b>	

- 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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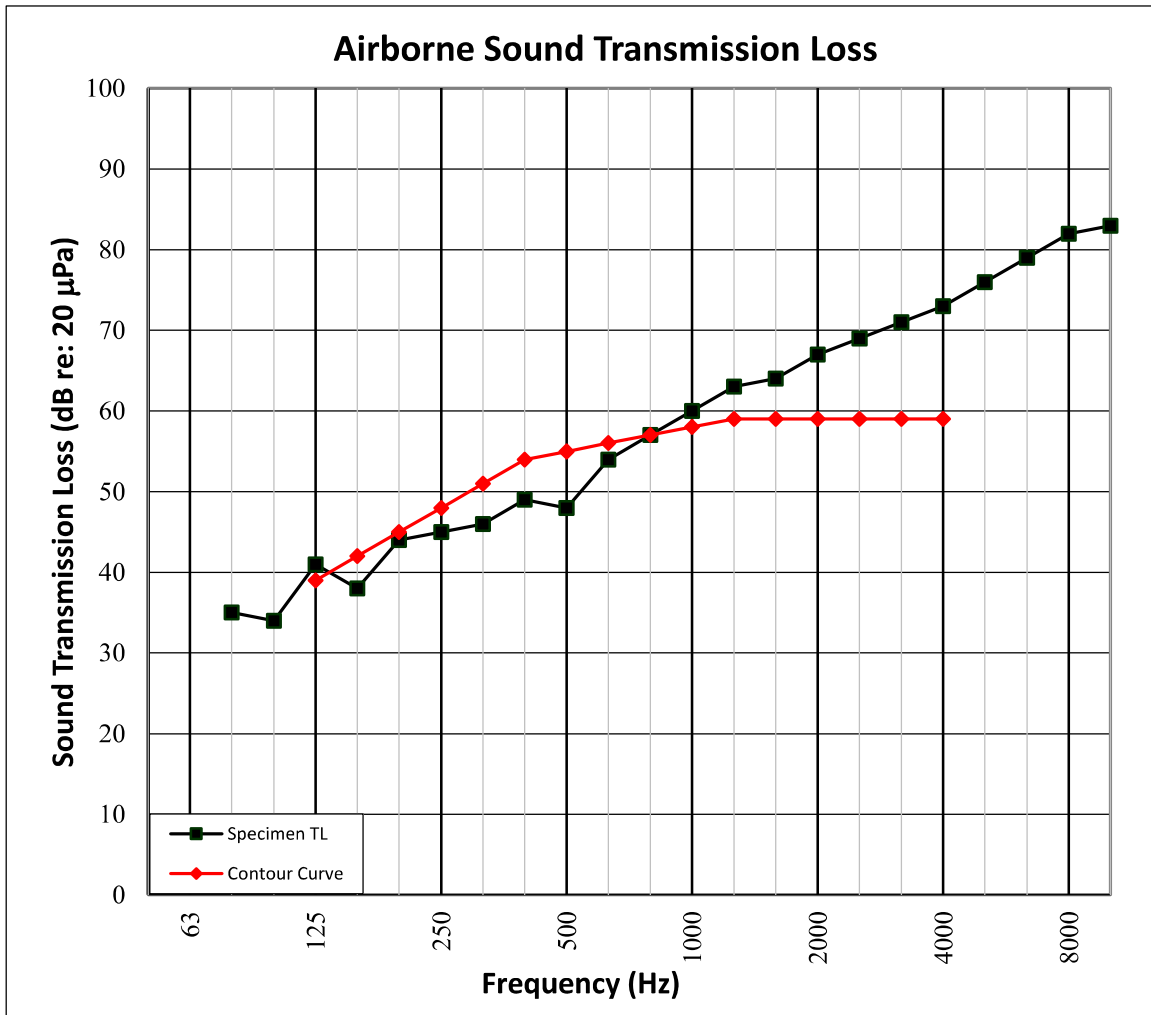
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### SECTION 11

#### TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH



<b>TEST DATE</b>	8/9/2021				
<b>DATA FILE NO.</b>	M4769.03				
<b>CLIENT</b>	Kährs International				
<b>DESCRIPTION</b>	13 mm Kährs Oak Carbon Engineered Wood, 2 mm QUIETSTRIDE 2.0 Sound Control Rubber Underlayment, 203.2 mm 5000 PSI Concrete Slab				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Receive Temp.</b>	22.4°C	<b>Source Temp.</b>	22.8°C
<b>TECHNICIAN</b>	CSK	<b>Receive Humidity</b>	71%	<b>Source Humidity</b>	71%





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### SECTION 12

#### TEST RESULTS - IMPACT SOUND TRANSMISSION



<b>TEST DATE</b>	8/9/2021				
<b>DATA FILE NO.</b>	M4769.03				
<b>CLIENT</b>	Kährs International				
<b>DESCRIPTION</b>	13 mm Kährs Oak Carbon Engineered Wood, 2 mm QUIETSTRIDE 2.0 Sound Control Rubber Underlayment, 203.2 mm 5000 PSI Concrete Slab				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Maximum Temp.</b>	22.4°C	<b>Minimum Temp.</b>	22.3°C
<b>TECHNICIAN</b>	CSK	<b>Max. Humidity</b>	71%	<b>Min. Humidity</b>	71%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m <sup>2</sup>	NORMALIZED IMPACT SPL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	34.5	14.9	50	2.0	-
100	31.1	11.0	51	1.2	0
125	30.0	10.2	55	1.3	0
160	24.5	9.6	58	1.2	2
200	21.9	12.0	61	0.9	5
250	19.4	10.8	62	0.9	6
315	22.4	11.2	62	0.9	6
400	18.7	10.1	58	0.7	3
500	19.3	9.2	59	0.6	5
630	20.4	9.0	52	0.6	0
800	17.9	9.0	50	0.8	0
1000	17.7	8.9	44	0.7	0
1250	14.4	9.0	36	0.4	0
1600	12.1	9.5	32	0.6	0
2000	14.4	10.2	28	0.5	0
2500	14.2	11.0	22	0.9	0
3150	13.8	11.8	16	0.9	0
4000	11.3	13.1	11	0.5	-
5000	12.2	14.6	9	0.5	-
6300	11.1	17.4	8	0.3	-
8000	9.5	21.9	9	0.2	-
10000	8.7	21.9	9	0.2	-
<b>IIC Rating</b>	<b>56</b>	<i>(Impact Insulation Class)</i>		<b>Sum of Deficiencies</b>	<b>27</b>

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

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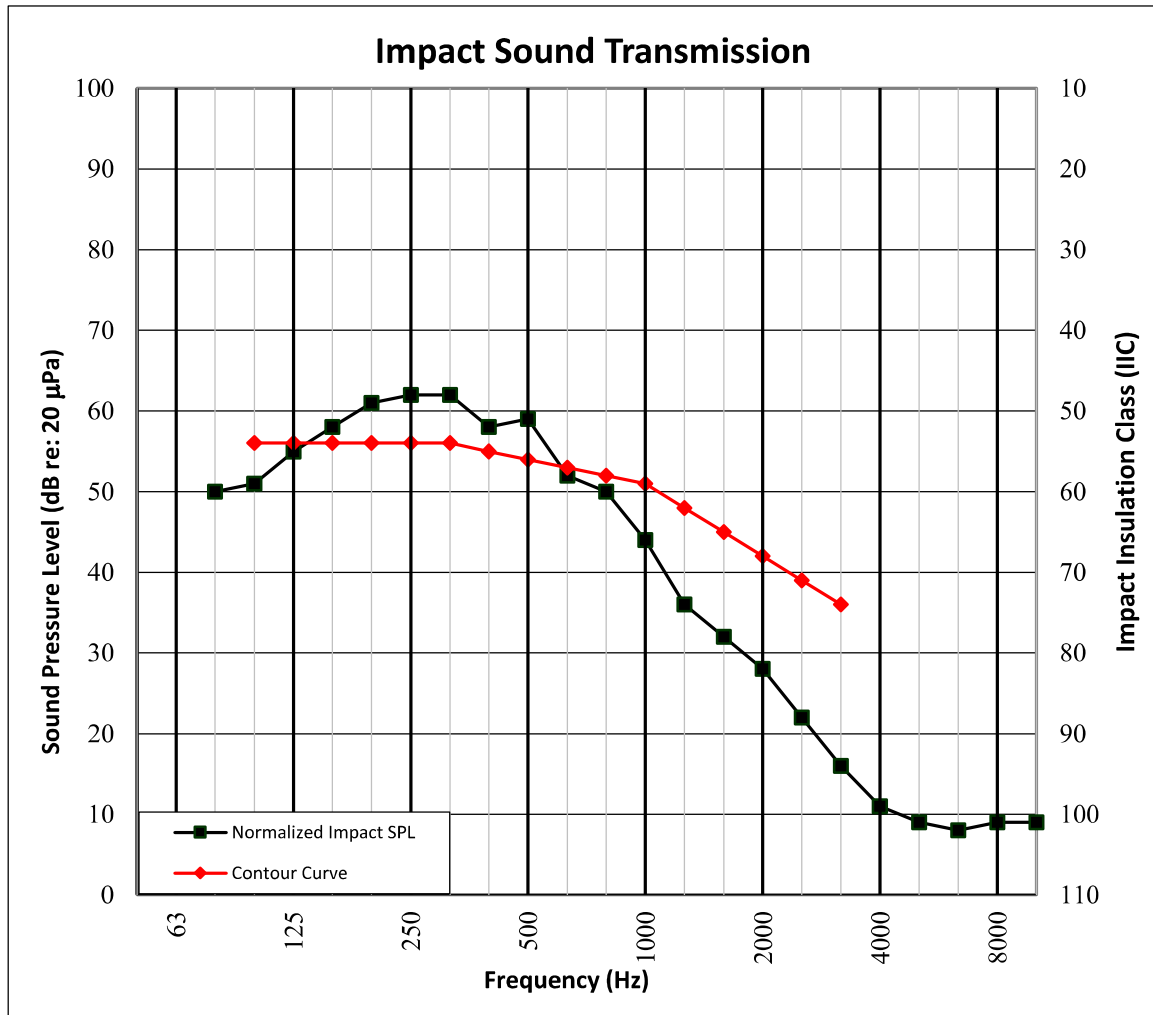
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### SECTION 13

#### TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH



<b>TEST DATE</b>	8/9/2021				
<b>DATA FILE NO.</b>	M4769.03				
<b>CLIENT</b>	Kährs International				
<b>DESCRIPTION</b>	13 mm Kährs Oak Carbon Engineered Wood, 2 mm QUIETSTRIDE 2.0 Sound Control Rubber Underlayment, 203.2 mm 5000 PSI Concrete Slab				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Maximum Temp.</b>	22.4°C	<b>Minimum Temp.</b>	22.3°C
<b>TECHNICIAN</b>	CSK	<b>Max. Humidity</b>	71%	<b>Min. Humidity</b>	71%



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### SECTION 14

#### TEST RESULTS - HIGH-FREQUENCY IMPACT SOUND TRANSMISSION



<b>TEST DATE</b>	8/9/2021				
<b>DATA FILE NO.</b>	M4769.03				
<b>CLIENT</b>	Kährs International				
<b>DESCRIPTION</b>	13 mm Kährs Oak Carbon Engineered Wood, 2 mm QUIETSTRIDE 2.0 Sound Control Rubber Underlayment, 203.2 mm 5000 PSI Concrete Slab				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Maximum Temp.</b>	22.4°C	<b>Minimum Temp.</b>	22.3°C
<b>TECHNICIAN</b>	CSK	<b>Max. Humidity</b>	71%	<b>Min. Humidity</b>	71%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m <sup>2</sup>	NORMALIZED IMPACT SPL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
400	18.7	10.1	58	0.7	6.5
500	19.3	9.2	59	0.6	7.6
630	20.4	9.0	52	0.6	1.5
800	17.9	9.0	50	0.8	1.5
1000	17.7	8.9	44	0.7	0.0
1250	14.4	9.0	36	0.4	0.0
1600	12.1	9.5	32	0.6	0.0
2000	14.4	10.2	28	0.5	0.0
2500	14.2	11.0	22	0.9	0.0
3150	13.8	11.8	16	0.9	0.0
<b>HIIC Rating</b>	<b>59</b>	<i>(High-Frequency Impact Insulation Class)</i>		<b>Sum of Deficiencies</b>	<b>17.0</b>

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

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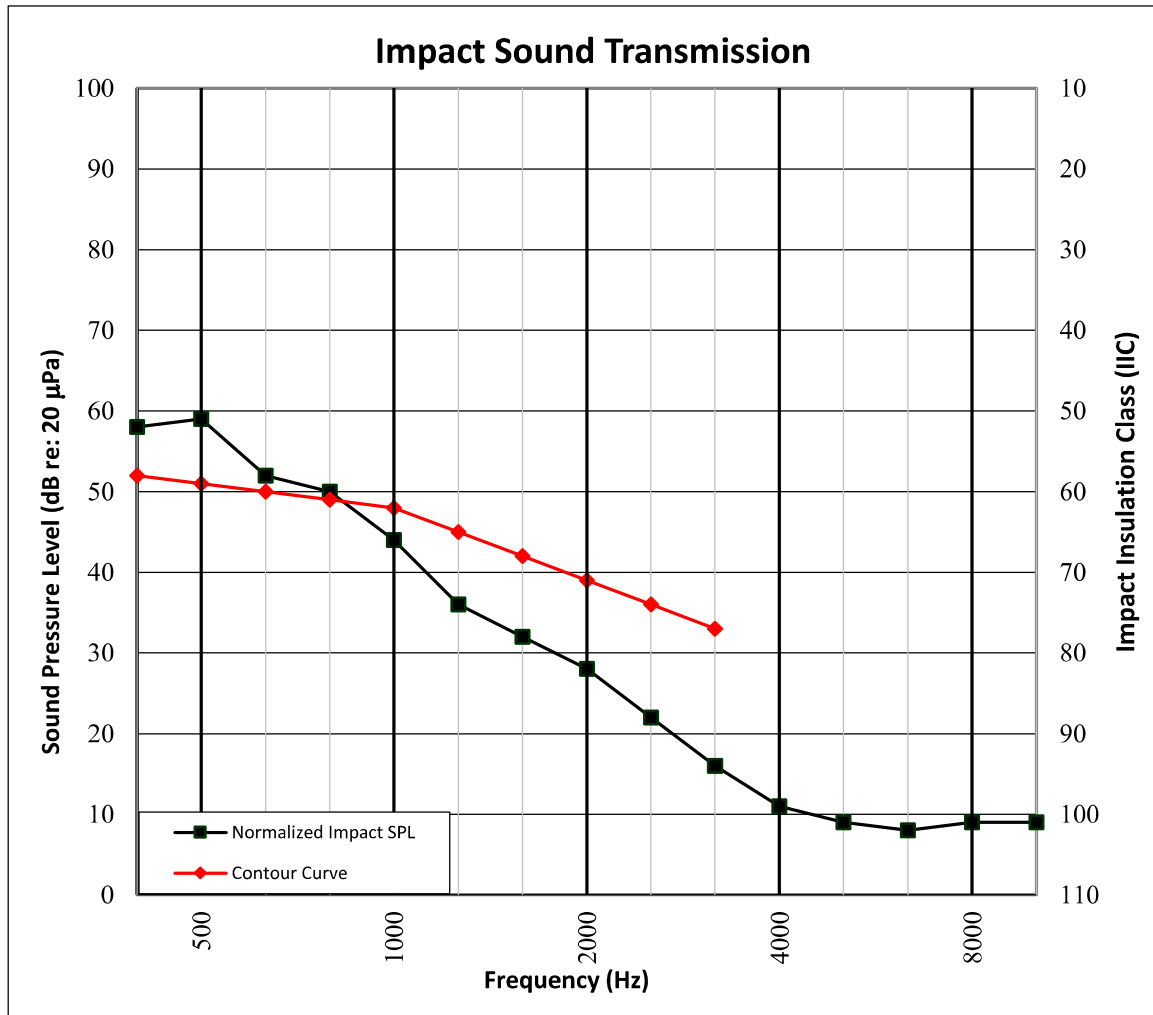
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### SECTION 15

#### TEST RESULTS -HIGH-FREQUENCY IMPACT SOUND TRANSMISSION GRAPH



<b>TEST DATE</b>	8/9/2021				
<b>DATA FILE NO.</b>	M4769.03				
<b>CLIENT</b>	Kährs International				
<b>DESCRIPTION</b>	13 mm Kährs Oak Carbon Engineered Wood, 2 mm QUIETSTRIDE 2.0 Sound Control Rubber Underlayment, 203.2 mm 5000 PSI Concrete Slab				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Maximum Temp.</b>	22.4°C	<b>Minimum Temp.</b>	22.3°C
<b>TECHNICIAN</b>	CSK	<b>Max. Humidity</b>	71%	<b>Min. Humidity</b>	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**

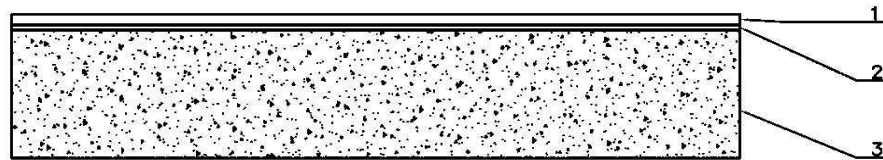
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### SECTION 17

#### DRAWING



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

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**SECTION 18**

**REVISION LOG**

REVISION #	DATE	PAGES	DESCRIPTION
R0	10/11/21	N/A	Original Report Issue
R1	11/15/21	Page 2	Updated company address