

AMORIM CORK COMPOSITES ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK

ASTM E90, ASTM E492, AND ASTM E2179 TESTING ON
WICANDERS HYDROCORK LVT OVER ACOUSTICORK® ENDURANCE UNDERLAYMENT

SPECIMEN TYPE

Concrete Slab - 152 mm (6")

REPORT NUMBER

J3893.05-113-11-R0

TEST DATE

02/09/19

ISSUE DATE

04/12/19

RECORD RETENTION END

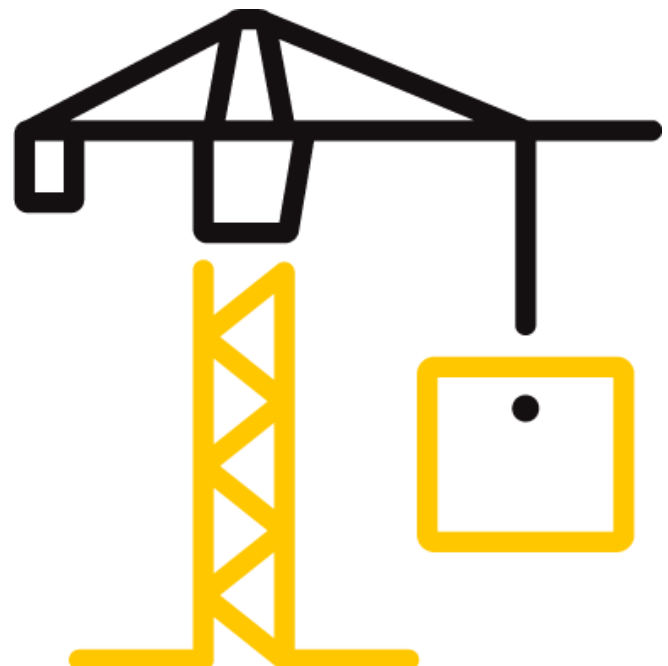
02/09/23

PAGES

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TEST REPORT FOR AMORIM CORK COMPOSITES

Report No.: J3893.05-113-11-R0

Date: 04/12/19

REPORT ISSUED TO

AMORIM CORK COMPOSITES

26112 110th Street

Trevor, Wisconsin 53179

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Amorim Cork Composites to perform testing in accordance with ASTM E90, ASTM E492, AND ASTM E2179 on Wicanders HydroCork LVT over AcoustiCORK® Endurance Underlayment. Results obtained are tested values and were secured by using the designated test method(s). 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.	J3893.02
SERIES/MODEL:	Wicanders HydroCork LVT over AcoustiCORK® Endurance Underlayment
STC	52
IIC	53
ΔIIC	23

COMPLETED BY: Seth J. Allen
Technician II - Acoustical
TITLE: Testing
SIGNATURE:
DATE: 04/12/19

COMPLETED BY: Jordan Strybos
Engineer, Team Lead -
TITLE: Acoustical Testing
SIGNATURE:
DATE: 04/12/19

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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 E2179-03(2016), *Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors*

ASTM E989-18, *Classification for Determination of Impact Insulation Class (IIC)*

ASTM E2235-04 (2012), *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*

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 (6")) 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 4115.6 kg / 9073.3 lbs. 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.

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**SECTION 5
EQUIPMENT**

INSTRUMENT	MANUFACTURER	MODEL	DESCRIPTION	ASSET #	CAL DATE
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	INT00977	08/18 *
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	65124	05/18 *
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	63763-1	06/18 *
Microphone Calibrator	Norsonic	Nor1251	Acoustical Calibrator	65105	06/18
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	65617	06/18
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64340	09/18
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63745	06/18
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63746	09/18
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63747	07/18
Receive Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63810	10/18
				63811	10/18
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63744	04/18
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63739	04/18
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63740	04/18
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63742	03/18
Source Room Microphone	PCB Electronics	378C20	Microphone and Preamplifier	63741	04/18
Source Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63812	10/18
Tapping Machine	Norsonic	Nor277	Tapping Machine	INT00936	12/18

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

VT RECEIVE ROOM VOLUME	158.86 m ³ (5610.1 ft ³)
VT SOURCE ROOM VOLUME	190 m ³ (6709.79 ft ³)

**SECTION 6
LIST OF OFFICIAL OBSERVERS**

NAME	COMPANY
Seth J. Allen	Intertek B&C
Michael K. Daniel	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 received 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), and Δ IIC (Delta Impact Insulation Class) ratings were calculated in accordance with ASTM E413, ASTM E989, and ASTM E2179, respectively.

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SECTION 9

TEST SPECIMEN DESCRIPTION

MATERIAL	Dimensions (mm/inch)	Thickness (mm/inch)	MANUFACTURER AND SERIES	QUANTITY	AVERAGE WEIGHT
Luxury Vinyl Tile	1225 by 145 48.2 by 5.7	6.2 / 0.24	Wicanders® HydroCork	10.98 m ² 118.19 ft ²	7.81 kg/m ² 1.6 lb/ft ²
	Note: Loose laid				
Underlayment	3632 by 1001 143 by 39.4	2 / 0.08	AcoustiCORK® Endurance	10.98 m ² 118.19 ft ²	0.84 kg/m ² 0.17 lb/ft ²
	Note: Loose laid				
Concrete Slab	3023 by 3632 119 by 143	152.4 / 6	5000 PSI	10.98 m ² 118.19 ft ²	366.18 kg/m ² 75 lb/ft 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	2/9/2019				
DATA FILE NO.	J3893.02				
CLIENT	Amorim Cork Composites				
DESCRIPTION	6.2 mm (0.24") Wicanders® HydroCork Luxury Vinyl Tile, 2 mm (0.08") AcoustiCORK® Endurance Underlayment, 152.4 mm (6") 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Receive Temp.	18.1°C (64.6°F)	Source Temp.	17.1°C (62.7°F)
TECHNICIAN	SJA	Receive Humidity	55%	Source Humidity	55%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
50	43.9	30.5	98	63	32	4.7	-
63	35.2	24.3	100	65	33	4.4	-
80	29.5	16.2	109	68	40	3.1	-
100	26.8	14.1	105	66	39	2.3	-
125	28.0	10.5	105	68	39	1.5	0
160	24.0	9.9	107	70	38	1.7	1
200	19.6	11.4	105	70	35	1.8	7
250	27.3	11.0	102	61	42	0.9	3
315	20.7	9.9	106	60	47	1.0	1
400	19.4	8.1	104	59	46	0.8	5
500	22.9	7.4	104	59	47	1.0	5
630	18.8	7.1	105	58	48	0.9	5
800	19.5	7.1	104	51	56	0.7	0
1000	20.0	7.1	104	45	62	0.7	0
1250	15.2	7.3	105	43	65	0.6	0
1600	10.1	7.5	105	40	67	0.6	0
2000	8.6	8.5	104	39	68	0.8	0
2500	5.8	9.6	102	37	68	0.5	0
3150	5.9	10.8	103	33	71	0.5	0
4000	5.6	12.6	104	31	73	0.9	0
5000	5.5	15.2	103	28	76	0.7	-
6300	5.9	19.7	97	18	77	0.7	-
8000	6.5	26.3	96	15	79	1.6	-
10000	6.6	26.3	91	11	77	1.0	-
STC Rating	52	<i>(Sound Transmission Class)</i>			Sum of Deficiencies	27	

- 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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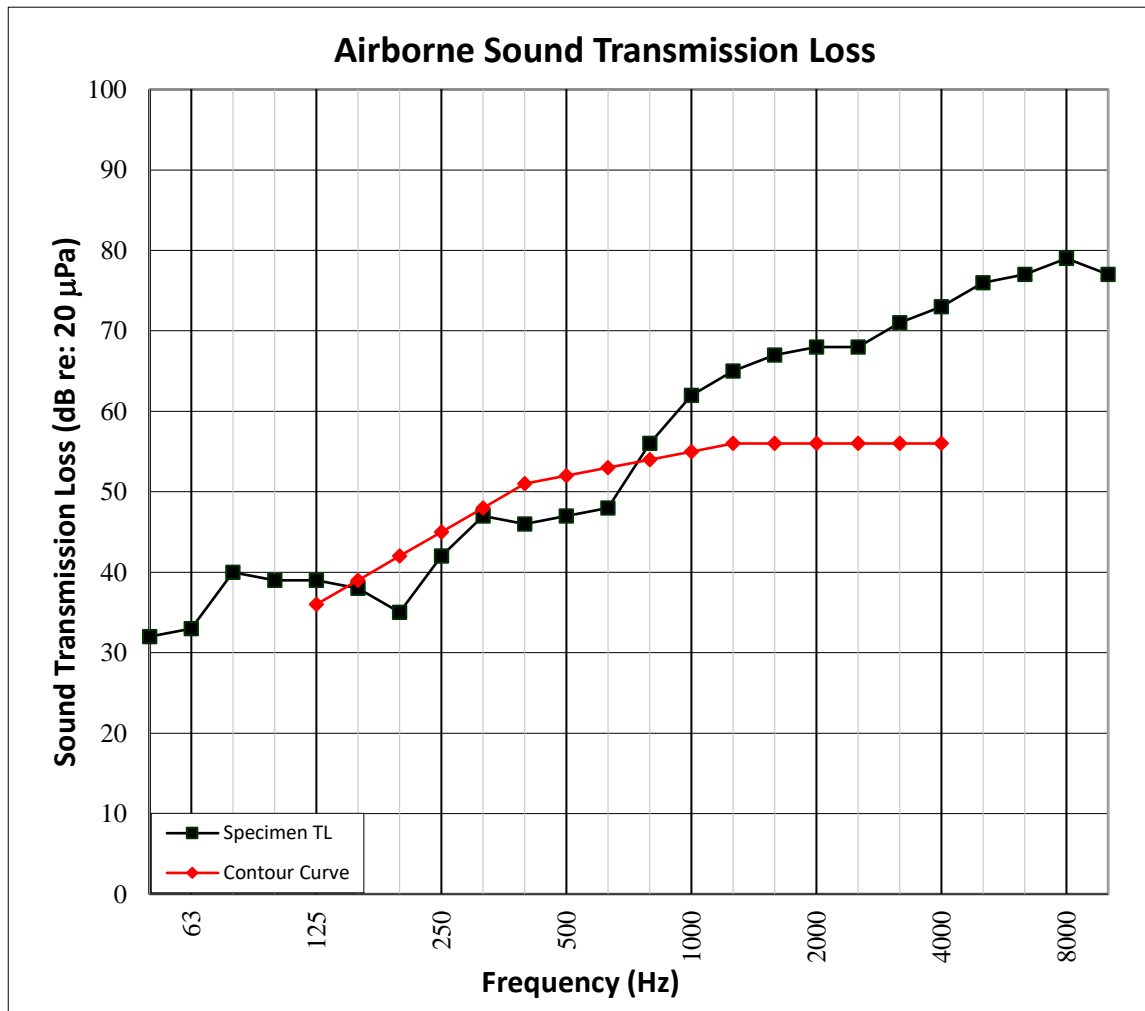
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SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH



TEST DATE	2/9/2019				
DATA FILE NO.	J3893.02				
CLIENT	Amorim Cork Composites				
DESCRIPTION	6.2 mm (0.24") Wicanders® HydroCork Luxury Vinyl Tile, 2 mm (0.08") AcoustiCORK® Endurance Underlayment, 152.4 mm (6") 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Receive Temp.	18.1°C (64.6°F)	Source Temp.	17.1°C (62.7°F)
TECHNICIAN	SJA	Receive Humidity	55%	Source Humidity	55%



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SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION



TEST DATE	2/9/2019				
DATA FILE NO.	J3893.02				
CLIENT	Amorim Cork Composites				
DESCRIPTION	6.2 mm (0.24") Wicanders® HydroCork Luxury Vinyl Tile, 2 mm (0.08") AcoustiCORK® Endurance Underlayment, 152.4 mm (6") 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	18.1°C (64.6°F)	Minimum Temp.	18.1°C (64.5°F)
TECHNICIAN	SJA	Max. Humidity	55%	Min. Humidity	54%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	NORMALIZED IMPACT SPL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
50	44.2	23.2	59	3.3	-
63	36.2	23.3	56	3.3	-
80	38.3	16.2	56	2.0	-
100	34.8	13.1	56	0.8	0
125	34.9	10.3	58	1.5	0
160	36.2	10.4	62	0.3	3
200	30.3	10.8	67	0.8	8
250	28.7	10.8	64	0.4	5
315	26.1	9.7	61	0.3	2
400	21.0	8.2	63	0.3	5
500	23.0	7.4	58	0.5	1
630	20.7	7.2	56	0.4	0
800	20.8	7.1	52	0.6	0
1000	19.5	7.1	46	0.6	0
1250	21.3	7.4	38	0.6	0
1600	12.9	7.5	31	0.5	0
2000	10.7	8.5	25	0.5	0
2500	8.1	9.6	20	0.8	0
3150	7.8	10.8	17	0.7	0
4000	6.8	12.7	15	0.6	-
5000	6.2	15.3	12	0.7	-
6300	8.9	19.6	11	0.4	-
8000	7.3	26.1	12	0.6	-
10000	6.7	26.1	12	0.6	-
IIC Rating	53	<i>(Impact Insulation Class)</i>		Sum of Deficiencies	24

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

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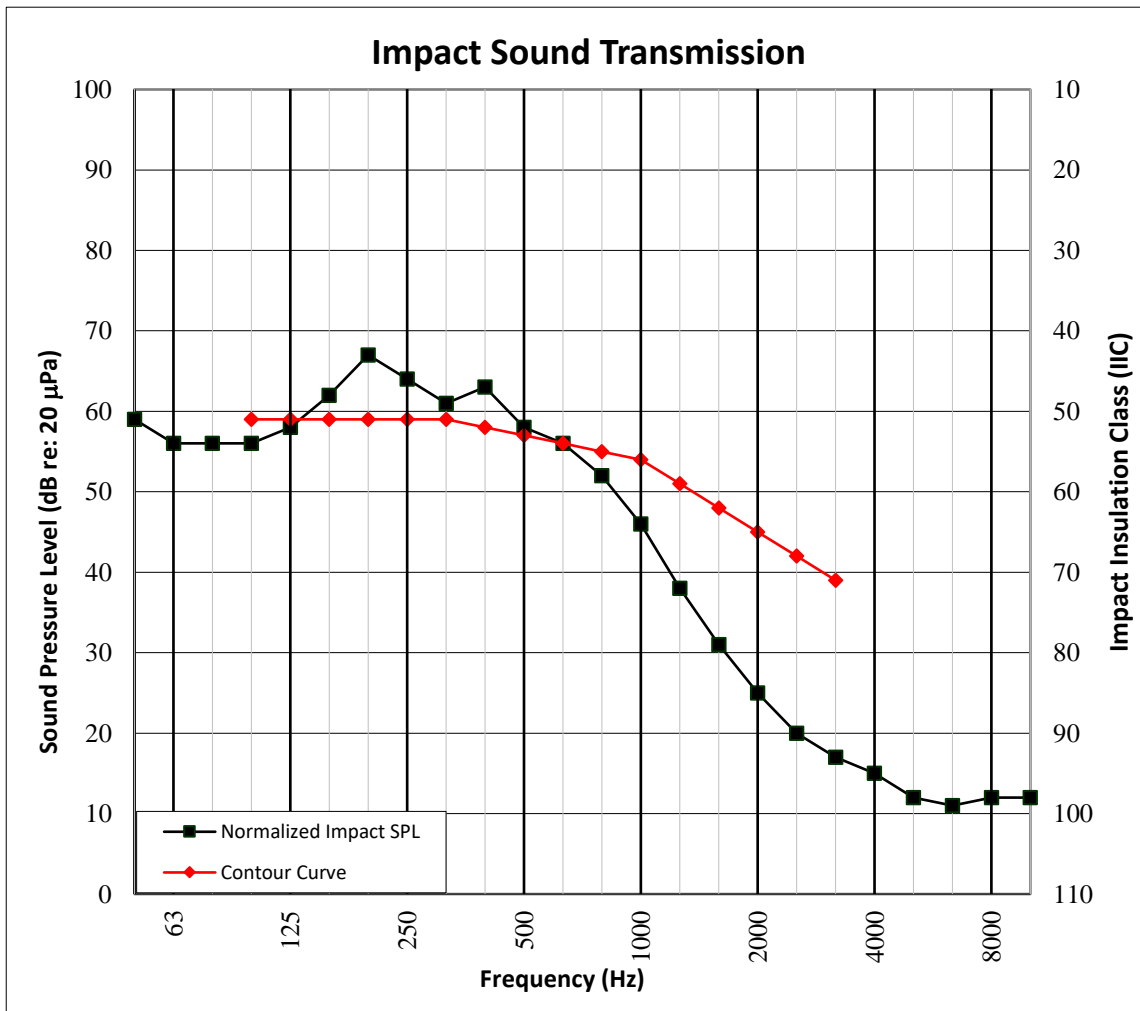
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SECTION 13

TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH



TEST DATE	2/9/2019				
DATA FILE NO.	J3893.02				
CLIENT	Amorim Cork Composites				
DESCRIPTION	6.2 mm (0.24") Wicanders® HydroCork Luxury Vinyl Tile, 2 mm (0.08") AcoustiCORK® Endurance Underlayment, 152.4 mm (6") 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	18.1°C (64.6°F)	Minimum Temp.	18.1°C (64.5°F)
TECHNICIAN	SJA	Max. Humidity	55%	Min. Humidity	54%



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SECTION 14

TEST RESULTS - DELTA IMPACT INSULATION



TEST DATE	2/9/2019				
DATA FILE NO.	J3893.02				
CLIENT	Amorim Cork Composites				
DESCRIPTION	6.2 mm (0.24") Wicanders® HydroCork Luxury Vinyl Tile, 2 mm (0.08") AcoustiCORK® Endurance Underlayment, 152.4 mm (6") 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	18.1°C (64.6°F)	Minimum Temp.	18.1°C (64.5°F)
TECHNICIAN	SJA	Max. Humidity	55%	Min. Humidity	54%

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	34.8	13.1	58.0	1.0	56.2	0.9	65.0	4
125	34.9	10.3	60.0	1.9	57.5	1.9	65.0	4
160	36.2	10.4	65.1	0.5	62.5	0.4	65.0	4
200	30.3	10.8	70.4	0.9	67.4	0.9	65.0	4
250	28.7	10.8	67.8	0.6	63.7	0.5	65.0	4
315	26.1	9.7	66.5	0.4	61.4	0.4	64.0	3
400	21.0	8.2	70.2	0.6	63.1	0.4	63.0	3
500	23.0	7.4	68.3	0.6	58.1	0.7	60.0	1
630	20.7	7.2	69.9	0.5	56.5	0.5	58.0	0
800	20.8	7.1	71.2	0.5	52.5	0.7	53.0	0
1000	19.5	7.1	71.2	0.5	45.5	0.8	46.0	0
1250	21.3	7.4	72.3	0.5	37.8	0.7	38.0	0
1600	12.9	7.5	73.3	0.5	30.7	0.7	29.0	0
2000	10.7	8.5	73.5	0.6	24.7	0.6	23.0	0
2500	8.1	9.6	73.3	0.8	19.8	1.0	19.0	0
3150	7.8	10.8	72.5	0.7	16.7	0.8	16.0	0
ΔIIC Rating	23	<i>(Delta Impact Insulation Class)</i>			Sum of Deficiencies	27		

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

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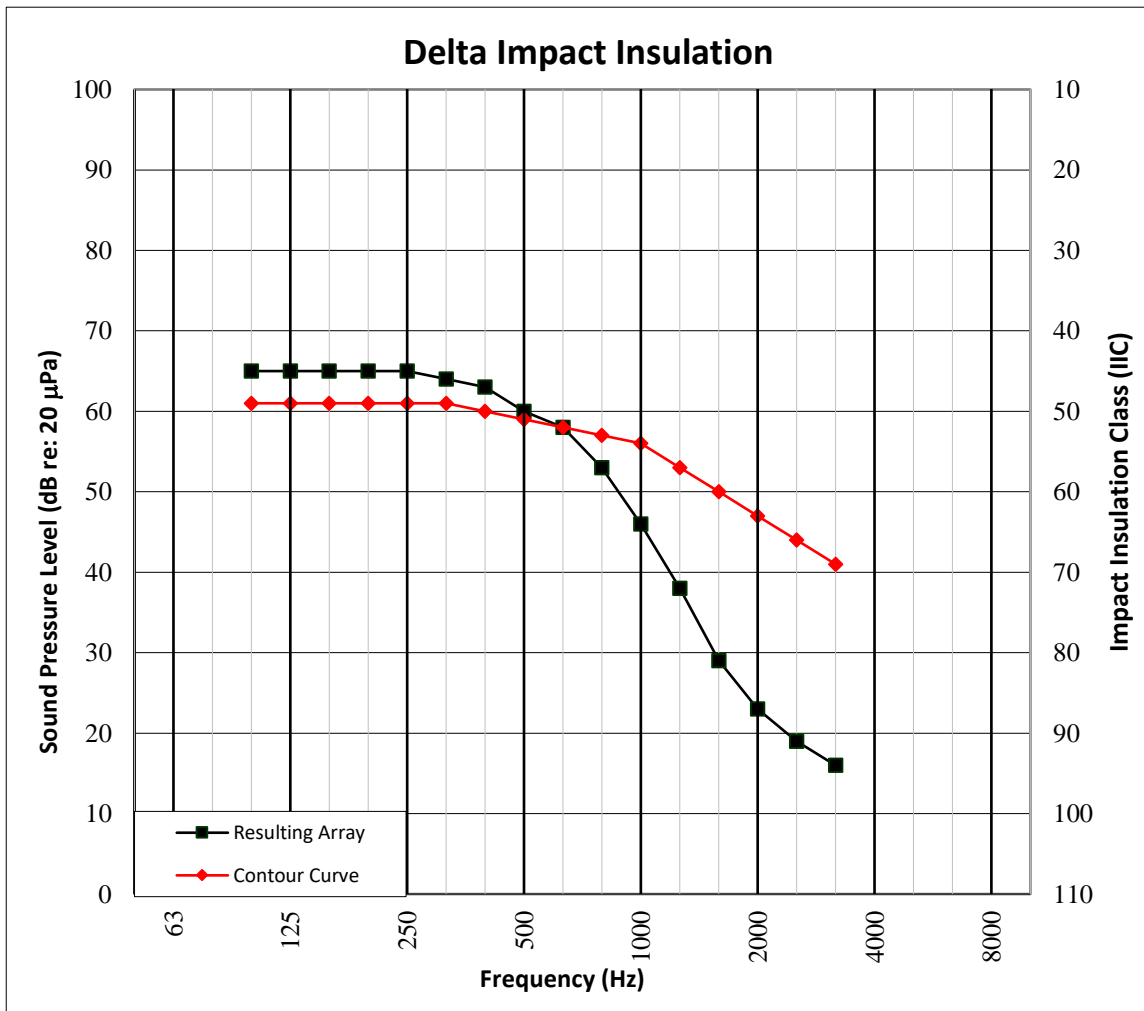
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SECTION 15

TEST RESULTS - DELTA IMPACT INSULATION GRAPH



TEST DATE	2/9/2019				
DATA FILE NO.	J3893.02				
CLIENT	Amorim Cork Composites				
DESCRIPTION	6.2 mm (0.24") Wicanders® HydroCork Luxury Vinyl Tile, 2 mm (0.08") AcoustiCORK® Endurance Underlayment, 152.4 mm (6") 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	18.1°C (64.6°F)	Minimum Temp.	18.1°C (64.5°F)
TECHNICIAN	SJA	Max. Humidity	55%	Min. Humidity	54%



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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

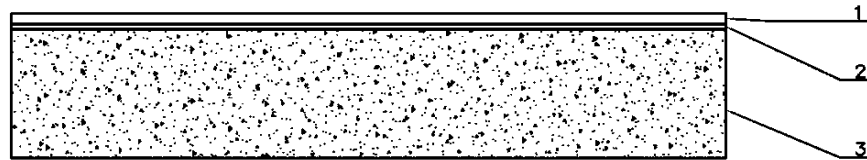
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SECTION 17

DRAWING



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

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SECTION 18

REVISION LOG

REVISION #	DATE	PAGES	DESCRIPTION
R0	04/12/19	N/A	Original Report Issue