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AMORIM CORK COMPOSITES ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK
ASTM E90 AND ASTM E492 TESTING ON
WICANDERS HYDROCORK LVT OVER ACOUSTICORK® ENDURANCE UNDERLAYMENT

SPECIMEN TYPE
152 mm (6") Concrete Slab with Drop Ceiling

REPORT NUMBER
J3893.03-113-11-R0

TEST DATE
02/08/19

ISSUE DATE
02/12/19

RECORD RETENTION END
02/08/23

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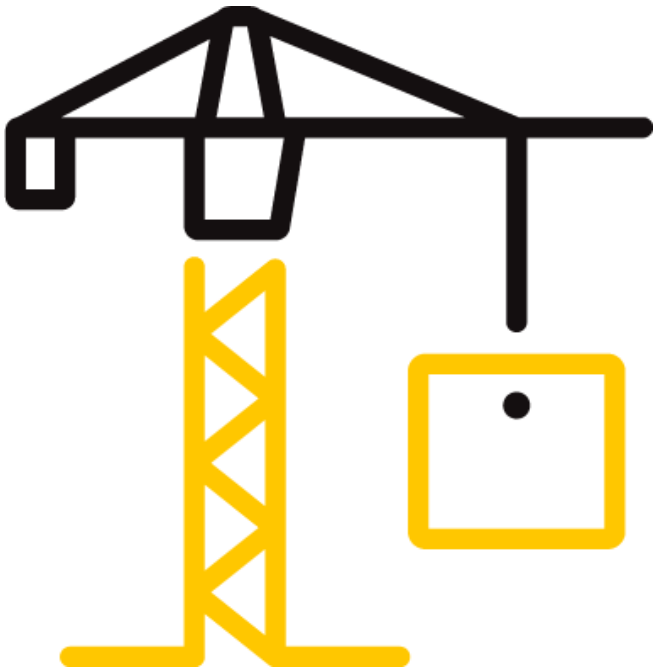

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TEST REPORT FOR AMORIM CORK COMPOSITES

Report No.: J3893.03-113-11-R0
Date: 02/12/19

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 AND ASTM E492 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.	J3893.03
SERIES/MODEL:	Wicanders HydroCork LVT over AcoustiCORK® Endurance Underlayment
STC	62
IIC	67

COMPLETED BY:	Seth J. Allen	**COMPLETED BY:**	Jordan Strybos
TITLE:	Technician II - Acoustical Testing	**TITLE:**	Engineer, Team Lead - Acoustical Testing
SIGNATURE:	Digitally Signed for: Seth Allen by Janine Sobell	**SIGNATURE:**	Digitally Signed by: Jordan Strybos
DATE:	02/12/19	**DATE:**	02/12/19

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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 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 (152 mm (6") Concrete Slab with Drop Ceiling) 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 4265.8 kg / 9404.1 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	155.77 m^3 (5500.85 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 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) and IIC (Impact Insulation Class) ratings were calculated in accordance with ASTM E413 and ASTM E989, 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 m² 118.19 ft²	7.81 kg/m² 1.6 lb/ft²
	Note: Loose laid				
Underlayment	3632 by 1001 143 by 39.4	2 / 0.08	AcoustiCORK® Endurance	10.98 m² 118.19 ft²	0.84 kg/m² 0.17 lb/ft²
	Note: Loose laid				
Concrete Slab	3023 by 3632 119 by 143	152.4 / 6	5000 PSI	10.98 m² 118.19 ft²	366.18 kg/m² 75 lb/ft²
	Note: Installed in a test frame flush to the source room. Mats of #5 reinforcing bars were placed 25.4 mm (1") from both the top and bottom of the slab, with bars spaced on 305 mm (12") centers in both directions. No noticeable shrinkage or cracking was visible on the specimen.				
Drywall Main Beam	38.1 by 2870 1.5 by 113	43 / 1.69	Armstrong HD8906	10.9 lin m 35.76 lin ft	0.45 kg/m 0.3 lb/ft
	Note: Twelve gauge hanger wires were attached to the bottom side of the concrete at twelve locations and then to the main beams. The hanger wire was twisted around itself a minimum of three times within 76 mm (3") creating a 305 mm (12") plenum. The measured steel thickness was 0.5 mm (0.02").				
Cross Tee	38.3 by 1219 1.5 by 48	37.3 / 1.47	Armstrong XL8945P	27.2 lin m 89.24 lin ft	0.45 kg/m 0.3 lb/ft
	Note: Inserted into the main beams on 610 mm (24") centers. The measured steel thickness was 0.5 mm (0.02").				
Fiberglass Insulation	609.6 by 2438 24 by 96	88.9 / 3.5	Johns Manville Unfaced R-13	10.98 m² 118.19 ft²	1.32 kg/m² 0.27 lb/ft²
	Note: Loose laid onto the ceiling grid system				
Gypsum Panel	3023 by 1219 119 by 48	15.9 / 0.63	National Gypsum Gold Bond® Fire-Shield® Type X	10.56 m² 113.67 ft²	11.23 kg/m² 2.3 lb/ft²
	Note: Fastened with 25.4 mm (1") fine thread drywall screws on 305 mm (12") centers. Seams and perimeter sealed with Pecora AC-20® Acoustical Sealant and covered with pressure-sensitive tape.				

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SECTION 10

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS

IAS ACCREDITED Testing Laboratory

TEST DATE	2/8/2019				
DATA FILE NO.	J3893.03				
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, 43 mm (1.69") Armstrong HD8906 Drywall Main Beam, 37.3 mm (1.47") Armstrong XL8945P Cross Tee, 88.9 mm (3.5") Johns Manville Unfaced R-13 Fiberglass Insulation, 15.9 mm (0.63") National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel				
SPECIMEN AREA	10.98 m²	**Receive Temp.**	16.4°C (61.5°F)	**Source Temp.**	18.4°C (65.1°F)
TECHNICIAN	SJA	**Receive Humidity**	67%	**Source Humidity**	67%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m²	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
50	40	32.3	101	62	36	4.8	-
63	39.1	23.7	101	63	36	4.7	-
80	39.6	17.7	111	67	42	4.0	-
100	36.1	10.9	108	67	42	2.9	-
125	31.3	11.1	106	66	41	1.7	5
160	28.8	9.5	106	67	41	1.2	8
200	26.0	9.6	105	56	50	1.2	2
250	30.9	9.9	103	52	52	0.9	3
315	24.0	9.9	106	53	55	0.6	3
400	20.0	8.2	104	49	58	0.7	3
500	22.7	7.6	105	47	61	0.8	1
630	24.4	7.5	105	45	62	0.6	1
800	23.7	7.4	104	41	67	0.3	0
1000	25.1	7.2	104	39	68	0.3	0
1250	24.8	7.4	105	39	69	0.4	0
1600	19.3	7.4	105	38	69	0.3	0
2000	17.3	8.4	104	38	69	0.5	0
2500	13.2	9.3	102	36	69	0.3	0
3150	11.3	10.4	103	32	73	0.4	0
4000	8.8	11.7	104	31	74	0.6	0
5000	6.9	13.7	104	28	76	0.5	-
6300	6.5	17.3	97	19	78	0.6	-
8000	6.7	22.5	97	15	81	0.9	-
10000	6.8	22.5	91	8	82	0.7	-
STC Rating	**62**	*(Sound Transmission Class)*			**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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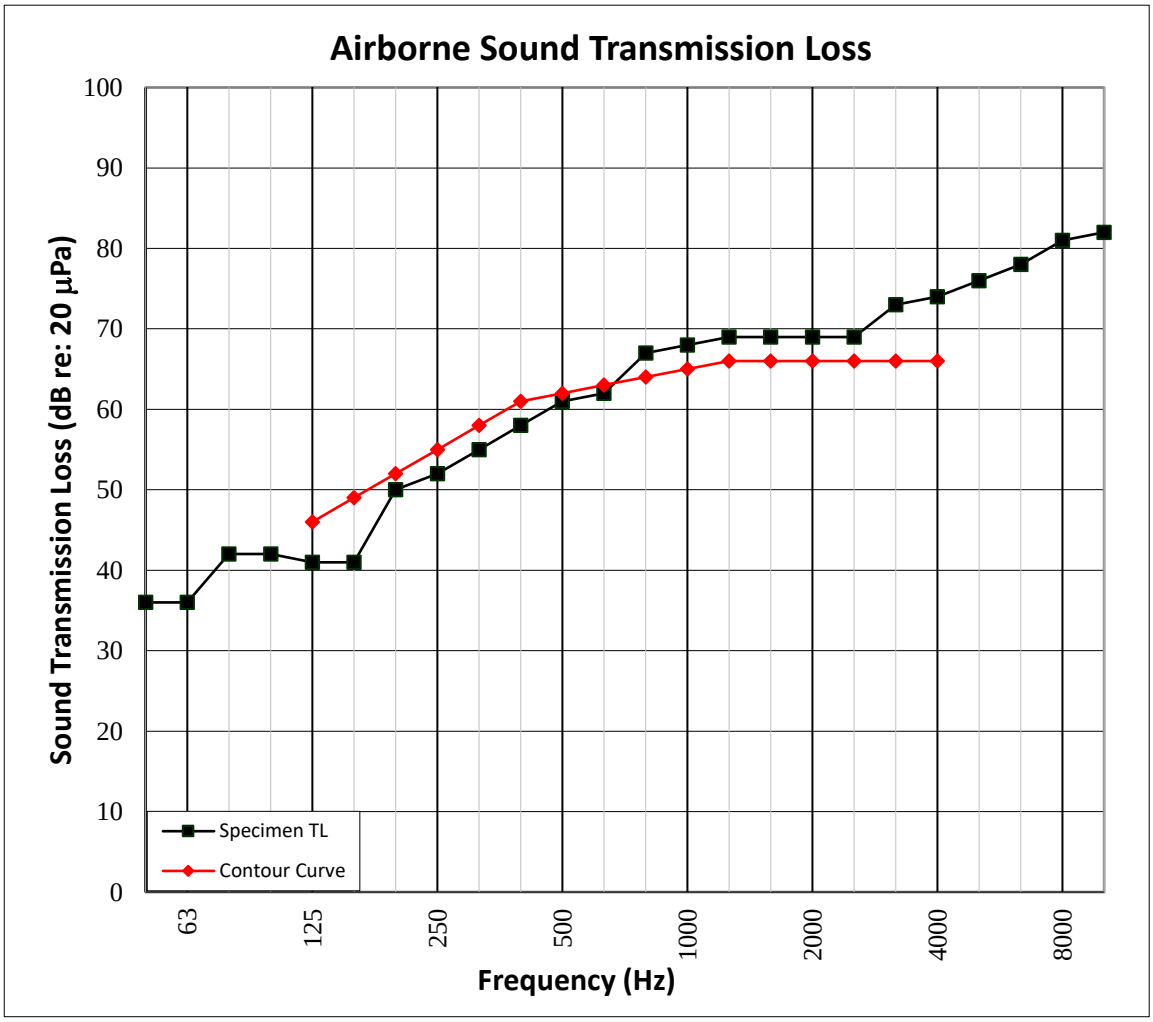
SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH

TEST DATE	2/8/2019				
DATA FILE NO.	J3893.03				
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, 43 mm (1.69") Armstrong HD8906 Drywall Main Beam, 37.3 mm (1.47") Armstrong XL8945P Cross Tee, 88.9 mm (3.5") Johns Manville Unfaced R-13 Fiberglass Insulation, 15.9 mm (0.63") National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel				
SPECIMEN AREA	10.98 m²	**Receive Temp.**	16.4°C (61.5°F)	**Source Temp.**	18.4°C (65.1°F)
TECHNICIAN	SJA	**Receive Humidity**	67%	**Source Humidity**	67%



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SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION

IAS ACCREDITED Testing Laboratory

TEST DATE	2/8/2019				
DATA FILE NO.	J3893.03				
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, 43 mm (1.69") Armstrong HD8906 Drywall Main Beam, 37.3 mm (1.47") Armstrong XL8945P Cross Tee, 88.9 mm (3.5") Johns Manville Unfaced R-13 Fiberglass Insulation, 15.9 mm (0.63") National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	16.6°C (61.9°F)	**Minimum Temp.**	16.3°C (61.3°F)
TECHNICIAN	SJA	**Max. Humidity**	68%	**Min. Humidity**	67%

FREQ (Hz)	**BACKGROUND SPL** (dB)	**ABSORPTION** m²	**NORMALIZED IMPACT SPL** (dB)	**95% CONFIDENCE LIMIT**	**NUMBER OF DEFICIENCIES**
50	40.8	31.8	60	2.9	-
63	39.9	26.5	56	3.4	-
80	37.8	16.3	50	2.0	-
100	28.4	11.6	51	1.2	6
125	29.9	11.0	48	1.1	3
160	31.3	9.7	48	0.8	3
200	24.3	9.8	48	0.4	3
250	30.7	10.1	50	0.8	5
315	25.4	9.7	49	0.5	4
400	21.2	8.4	49	0.9	5
500	21.8	7.5	44	0.4	1
630	21.3	7.6	41	0.6	0
800	22.6	7.2	37	0.5	0
1000	24.6	7.1	30	0.6	0
1250	24.6	7.4	23	0.4	0
1600	21.5	7.5	19	0.4	0
2000	17.6	8.4	16	0.3	0
2500	14.3	9.4	13	0.3	0
3150	13.0	10.4	13	0.7	0
4000	12.6	11.8	10	0.4	-
5000	11.2	13.7	9	0.4	-
6300	10.1	17.2	9	0.4	-
8000	12.6	22.4	10	0.5	-
10000	12.8	22.4	10	0.5	-
IIC Rating	**67**	*(Impact Insulation Class)*		**Sum of Deficiencies**	**30**

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

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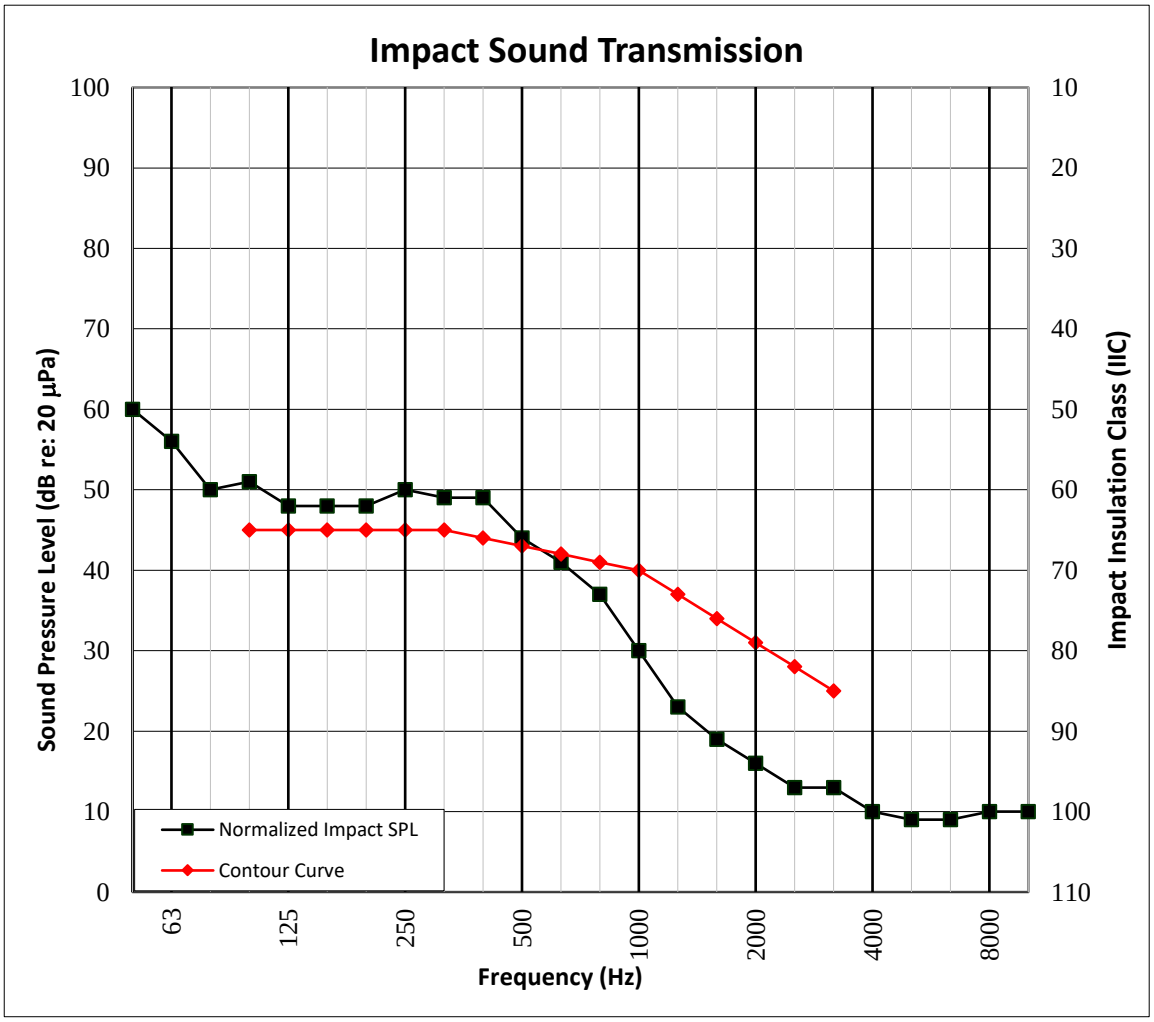
SECTION 13

TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH

TEST DATE	2/8/2019				
DATA FILE NO.	J3893.03				
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, 43 mm (1.69") Armstrong HD8906 Drywall Main Beam, 37.3 mm (1.47") Armstrong XL8945P Cross Tee, 88.9 mm (3.5") Johns Manville Unfaced R-13 Fiberglass Insulation, 15.9 mm (0.63") National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	16.6°C (61.9°F)	**Minimum Temp.**	16.3°C (61.3°F)
TECHNICIAN	SJA	**Max. Humidity**	68%	**Min. Humidity**	67%



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SECTION 14
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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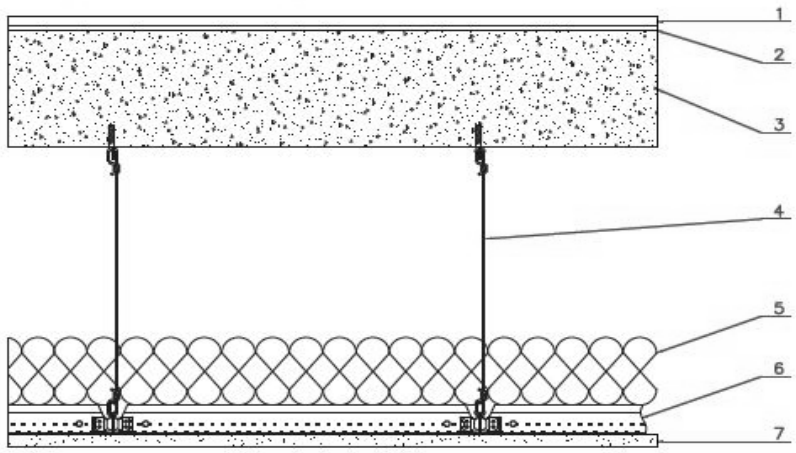
SECTION 15
DRAWING



1-Floor Topping
2-Underlayment
3-Concrete Slab
4-Hanger Wire
5-Insulation
6-Ceiling Grid
7-Ceiling

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SECTION 16
REVISION LOG

REVISION #	DATE	PAGES	DESCRIPTION
R0	02/12/19	N/A	Original Report Issue