



H1810.12-113-11-R0
ACOUSTICAL PERFORMANCE TEST REPORT
ASTM E 90 AND ASTM E 492

Rendered to

AMORIM CORK COMPOSITES

Series/Model: AcoustiCORK® ECOx2 Sound Reduction Underlayment for LVT Plank Flooring

Specimen Type: 152 mm (6") Concrete Slab with Drop Ceiling

Overall Size: 3023 mm by 3632 mm (119" by 143")

STC	62
IIC	66

Test Specimen Identification:

Floor Topping: 3 mm (0.12") Flexco Premium Wood Vinyl Plank

Floor Underlayment: 1.9 mm (0.07") AcoustiCORK® ECOx2 Sound Reduction Underlayment for LVT Plank Flooring

Floor Slab: 152.4 mm (6") 5000 PSI Concrete Slab

Main Beams: 43 mm (1.69") Armstrong HD8906 Drywall Main Beam

Cross Tees: 37.3 mm (1.47") Armstrong XL8945P Cross Tee

Insulation: 88.9 mm (3.5") Johns Manville Kraft Faced R-13 Fiberglass Insulation

Ceiling: 15.9 mm (0.63") National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel

Reference should be made to Intertek-ATI Report H1810.12-113-11 for complete test specimen description. This page alone is not a complete report.



Acoustical Performance Test Report

AMORIM CORK COMPOSITES
26112 110th Street
Trevor, Wisconsin 53179

Report	H1810.12-113-11
Test Date	05/19/17
Report Date	10/13/17

Project Scope

Architectural Testing, Inc., an Intertek company (Intertek-ATI), was contracted to conduct airborne sound transmission loss and impact sound transmission tests. This report is a reissue in the name of Amorim Cork Composites through written authorization from the original report holder. The complete test data is included as attachments to this report. The full test specimen was assembled on the day of testing by Intertek-ATI. All materials provided by the client were installed on an existing Intertek-ATI assembly (152 mm (6") Concrete Slab with Drop Ceiling) utilizing Intertek-ATI-supplied materials.

Test Methods

The acoustical tests were conducted in accordance with the following standards. The equipment listed in the attachments meets the requirements of the following standards.

ASTM E 90-09 (2016), Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions

ASTM E 413-16, Classification for Rating Sound Insulation

ASTM E 492-09(2016)e1, Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine

ASTM E 989-06 (2012), Classification for Determination of Impact Insulation Class (IIC)

ASTM E 2235-04 (2012) Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods

Test Procedure

All testing was conducted in the VT test chambers at Intertek-ATI located in York, Pennsylvania. The microphones were calibrated before conducting the tests.

The airborne transmission loss test was conducted in accordance with the ASTM E 90 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. Four sound pressure level measurements were made simultaneously in both rooms, at each of five microphone positions.

Test Procedure (Continued)

The impact sound transmission test was conducted in accordance with the ASTM E 492 test method. Two background noise sound pressure level, two sound pressure level measurements with the tapping machine operating at each position specified by ASTM E 492, and five sound absorption measurements were conducted at each of five microphone positions.

The air temperature and relative humidity conditions were monitored and recorded during all measurements.

Test Conditions

Source Room		Receive Room	
Minimum Temperature	21.6°C (70.9°F)	Minimum Temperature	22.8°C (73°F)
Maximum Temperature	21.8°C (71.2°F)	Maximum Temperature	22.8°C (73.1°F)
Minimum Relative Humidity	57%	Minimum Relative Humidity	47%
Maximum Relative Humidity	57%	Maximum Relative Humidity	48%

Test Calculations

The STC (Sound Transmission Class) and IIC (Impact Insulation Class) ratings were calculated in accordance with ASTM E 413 and ASTM E 989, respectively.

Test Specimen Materials and Installation Details

Material	Dimensions (mm/inch)	Thickness (mm/inch)	Manufacturer and Series	Quantity	Average Weight
Premium Wood Vinyl Plank	914.4 by 101.6 36 by 4	3 / 0.12	Flexco	10.98 m ² 118.19 ft ²	4.51 kg/m ² 0.92 lb/ft ²
	<i>Note: Adhered to the underlayment with Excelsior MS 700 Modified Silane Wet Set Resilient Flooring Adhesive using a 0.79 mm by 1.59 mm by 0.79 mm (1/32" by 1/16" by 1/32") trowel. Adhesive was allowed to cure per manufacturer's specifications.</i>				
Sound Reduction Underlayment for LVT Plank Flooring	3023 by 1041 119 by 41	1.9 / 0.07	AcoustiCORK® ECOx2	10.98 m ² 118.19 ft ²	0.69 kg/m ² 0.14 lb/ft ²
	<i>Note: A sheet of 2 mil polyethylene plastic sheeting was adhered to the floor slab with 3M Super 77 spray adhesive. The underlayment was adhered to the sheeting with Excelsior MS 700 Modified Silane Wet Set Resilient Flooring Adhesive using a 0.79 mm by 1.59 mm by 0.79 mm (1/32" by 1/16" by 1/32") trowel. Adhesive was allowed to cure per manufacturer's specifications.</i>				
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
	<i>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</i>				
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
	<i>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 creating a 305 mm plenum. The measured steel thickness is 0.5 mm.</i>				

Test Specimen Materials and Installation Details (Continued)

Material	Dimensions (mm/inch)	Thickness (mm/inch)	Manufacturer and Series	Quantity	Average Weight
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
	<i>Note: Inserted into the main beams on 610 mm centers. The measured steel thickness is 0.5 mm.</i>				
Fiberglass Insulation	2962 by 584 116.6 by 23	88.9 / 3.5	Johns Manville Kraft Faced R-13	10.98 m ² 118.19 ft ²	1.33 kg/m ² 0.27 lb/ft ²
	<i>Note: Loose laid onto the ceiling grid system</i>				
Gypsum Panel	3023 by 1219 119 by 48	15.9 / 0.63	National Gypsum Gold Bond® Fire-Shield® Type X	10.56 m ² 113.67 ft ²	11.23 kg/m ² 2.3 lb/ft ²
	<i>Note: Fastened with 25.4 mm fine thread drywall screws on 305 mm centers. Seams and perimeter sealed with Pecora AC-20® Acoustical Sealant and covered with pressure-sensitive tape.</i>				

Comments

The total weight of the floor/ceiling assembly was 4228.1 kg / 9320.3 lbs. Intertek-ATI will store samples of the test specimen for four years. Photographs of the test specimen are included in the attachments. A drawing of the test specimen is included in the attachments.

This report is reissued in the name of Amorim Cork Composites through written authorization from the original report holder. The original Report No. is H1810.04-113-11.

Intertek-ATI 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 Intertek-ATI for the entire test record retention period. The test record retention period ends four years after the test date.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen tested. This report is intended to help in the client's quality assurance program, but it does not represent a continuous or exhaustive evaluation of the specimen tested or of other products or materials that were not evaluated. The statements and data provided herein do not constitute approval, disapproval, certification, or acceptance of performance or materials.

This report may not be reproduced, except in full, without the written approval of Intertek-ATI.

FOR INTERTEK-ATI:

Daniel B. Mohler
Project Lead - Acoustical Testing

Jordan Strybos
Project Manager - Acoustical Testing

Attachments (7 pages): This report is complete only when all attachments listed are included.

- Instrumentation (1)
- Airborne Sound Transmission Loss Data (2)
- Impact Sound Transmission Data (2)
- Photographs (1)
- Drawings (1)

** Stated by Client/Manufacturer*

N/A - Non Applicable

Revision Log

<u>Revision</u>	<u>Date</u>	<u>Page(s)</u>	<u>Description</u>
R0	10/13/17	N/A	Original Report Issue - Reissue of Report No. H1810.04-113-11 in the name of Amorim Cork Composites.

Attachments

Instrumentation

Instrument	Manufacturer	Model	ATI Number	Date of Calibration
Data Acquisition Unit	National Instruments	PXI-4462	65124	06/16 *
Microphone Calibrator	Norsonic	1251	INT00127	03/17
Receive Room Microphone	PCB Piezotronics	378C20	65617	05/17
Receive Room Microphone	PCB Piezotronics	378B20	63744	05/17
Receive Room Microphone	PCB Piezotronics	378B20	63745	05/17
Receive Room Microphone	PCB Piezotronics	378B20	63746	09/16
Receive Room Microphone	PCB Piezotronics	378B20	63747	05/17
Receive Room Environmental Indicator	Comet	T7510	63810	10/16
			63811	10/16
Source Room Microphone	PCB Piezotronics	378B20	63738	04/17
Source Room Microphone	PCB Piezotronics	378B20	63739	04/17
Source Room Microphone	PCB Piezotronics	378B20	63740	04/17
Source Room Microphone	PCB Piezotronics	378B20	63742	04/17
Source Room Microphone	PCB Electronics	378B20	63741	04/17
Source Room Environmental Indicator	Comet	T7510	63812	11/16
Tapping Machine	Look Line s.r.l.	EM50 (TM50)	65351	02/17

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

Test Chambers

VT Receive Room Volume	155.77 m ³ (5500.85 ft ³)
VT Source Room Volume	190 m ³ (6709.79 ft ³)



H1810.12-113-11-R0



AIRBORNE SOUND TRANSMISSION LOSS
ASTM E 90

Test Date	05/19/17
Data File No.	H1810.04
Client	Amorim Cork Composites
Description	3 mm (0.12") Flexco Premium Wood Vinyl Plank, 1.9 mm (0.07") AcoustiCORK® ECOx2 Sound Reduction Underlayment for LVT Plank Flooring, 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 Kraft Faced R-13 Fiberglass Insulation, 15.9 mm (0.63") National Gypsum Gold Bond® Fire-Shield® Type X
Specimen Area	10.98 m ²
Technician	Daniel B. Mohler

Freq (Hz)	Background SPL (dB)	Absorption (m ²)	Source SPL (dB)	Receive SPL (dB)	Specimen TL (dB)	95% Confidence Limit	Number of Deficiencies
50	37.5	33.9	104	62	37	4.30	-
63	37.2	23.5	102	63	36	4.40	-
80	41.8	16.7	109	67	40	5.10	-
100	33.9	11.8	107	68	39	2.00	-
125	34.0	10.2	104	63	41	1.30	5
160	33.1	9.6	107	63	44	1.30	5
200	28.4	10.6	104	57	48	1.00	4
250	29.4	9.8	103	53	51	0.80	4
315	25.5	9.7	106	53	54	0.70	4
400	24.4	8.4	104	48	58	0.70	3
500	23.2	8.2	103	43	61	0.40	1
630	25.0	7.6	102	39	65	0.40	0
800	23.1	8.0	102	38	66	0.70	0
1000	19.0	7.8	102	37	67	0.40	0
1250	18.7	8.1	100	35	67	0.30	0
1600	15.8	8.0	100	33	68	0.40	0
2000	12.3	8.7	101	34	68	0.40	0
2500	9.6	10.0	96	30	67	0.40	0
3150	8.5	10.4	98	28	70	0.40	0
4000	7.4	11.7	98	27	71	0.30	0
5000	6.5	13.4	95	23	72	0.40	-
6300	6.7	16.2	93	16	75	0.60	-
8000	7.0	20.9	93	14	77	0.70	-
10000	7.2	25.2	92	9	79	0.60	-

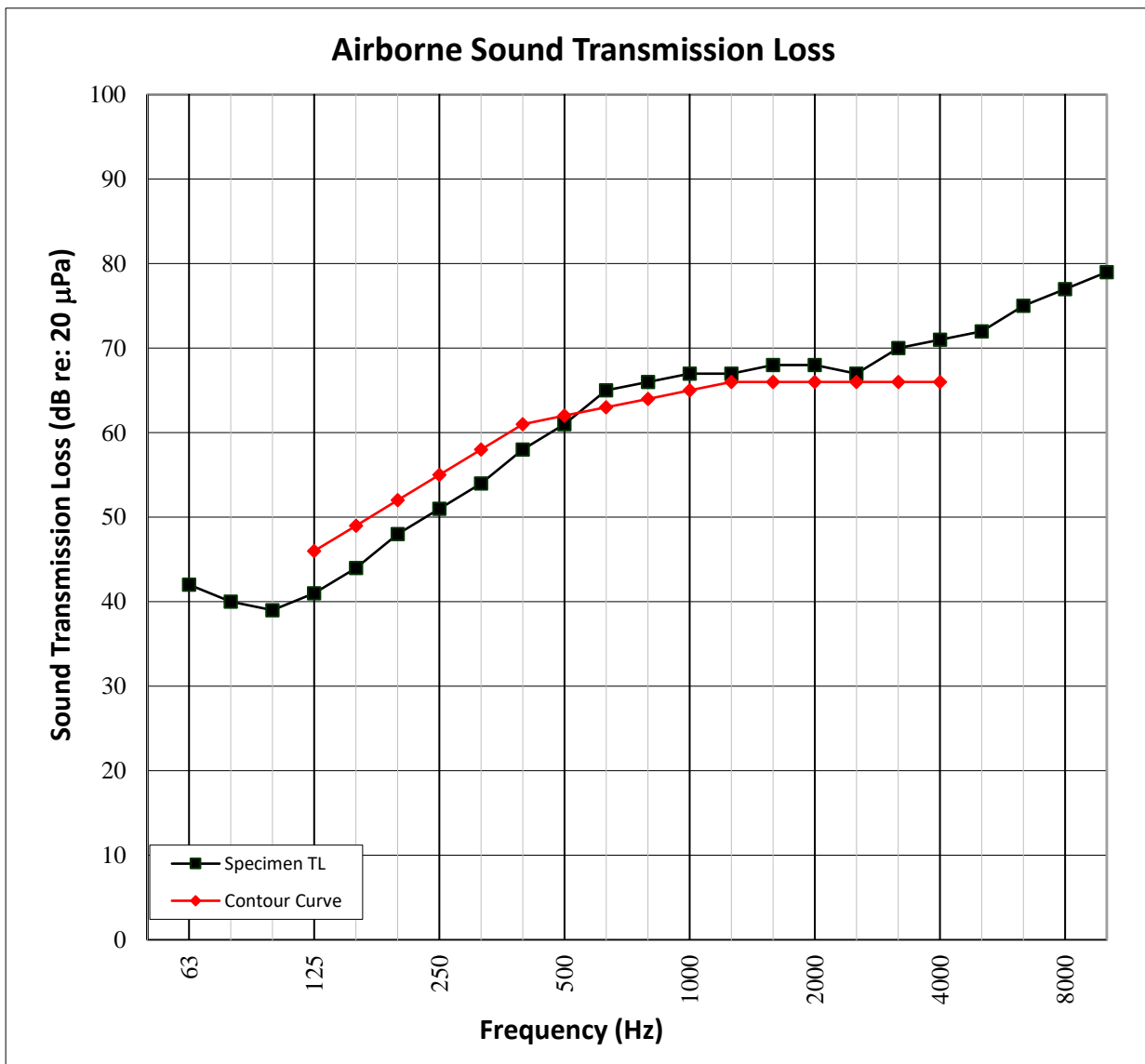
STC Rating **62** *(Sound Transmission Class)*

Deficiencies **26** *(Sum of Deficiencies)*

- 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

AIRBORNE SOUND TRANSMISSION LOSS
ASTM E 90

Test Date	05/19/17
Data File No.	H1810.04
Client	Amorim Cork Composites
Description	3 mm (0.12") Flexco Premium Wood Vinyl Plank, 1.9 mm (0.07") AcustiCORK® ECOx2 Sound Reduction Underlayment for LVT Plank Flooring, 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 Kraft Faced R-13 Fiberglass Insulation, 15.9 mm (0.63") National Gypsum Gold Bond® Fire-Shield® Type X
Specimen Area	10.98 m ²
Technician	Daniel B. Mohler





H1810.12-113-11-R0



IMPACT SOUND TRANSMISSION
ASTM E 492

Test Date	05/19/17
Data File No.	H1810.04
Client	Amorim Cork Composites
Description	3 mm (0.12") Flexco Premium Wood Vinyl Plank, 1.9 mm (0.07") AcoustiCORK® ECOx2 Sound Reduction Underlayment for LVT Plank Flooring, 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 Kraft Faced R-13 Fiberglass Insulation, 15.9 mm (0.63") National Gypsum Gold Bond® Fire-Shield® Type X
Specimen Area	10.98 m ²
Technician	Daniel B. Mohler

Freq (Hz)	Background SPL (dB)	Absorption (m ²)	Normalized Impact SPL (dB)	95% Confidence Limit	Number of Deficiencies
50	37.1	35.4	59	3.1	-
63	37.6	23.3	53	3.4	-
80	41.4	18.0	47	1.5	-
100	34.1	11.3	52	0.9	6
125	34.1	10.3	48	1.2	2
160	32.4	9.7	48	1.1	2
200	28.6	10.5	47	0.7	1
250	29.6	10.4	50	0.8	4
315	25.5	9.6	50	0.7	4
400	24.4	8.3	48	0.5	3
500	23.1	8.0	45	0.6	1
630	24.7	7.7	45	0.4	2
800	23.3	8.0	42	0.5	0
1000	19.6	7.8	35	0.5	0
1250	18.7	8.0	28	0.7	0
1600	16.0	8.0	21	0.8	0
2000	12.4	8.8	17	1.1	0
2500	9.7	10.0	13	1.0	0
3150	8.6	10.4	14	0.8	0
4000	7.4	11.7	10	0.6	-
5000	6.6	13.3	7	0.5	-
6300	6.7	16.2	7	0.3	-
8000	7.0	21.0	8	0.2	-
10000	7.1	25.1	9	0.2	-

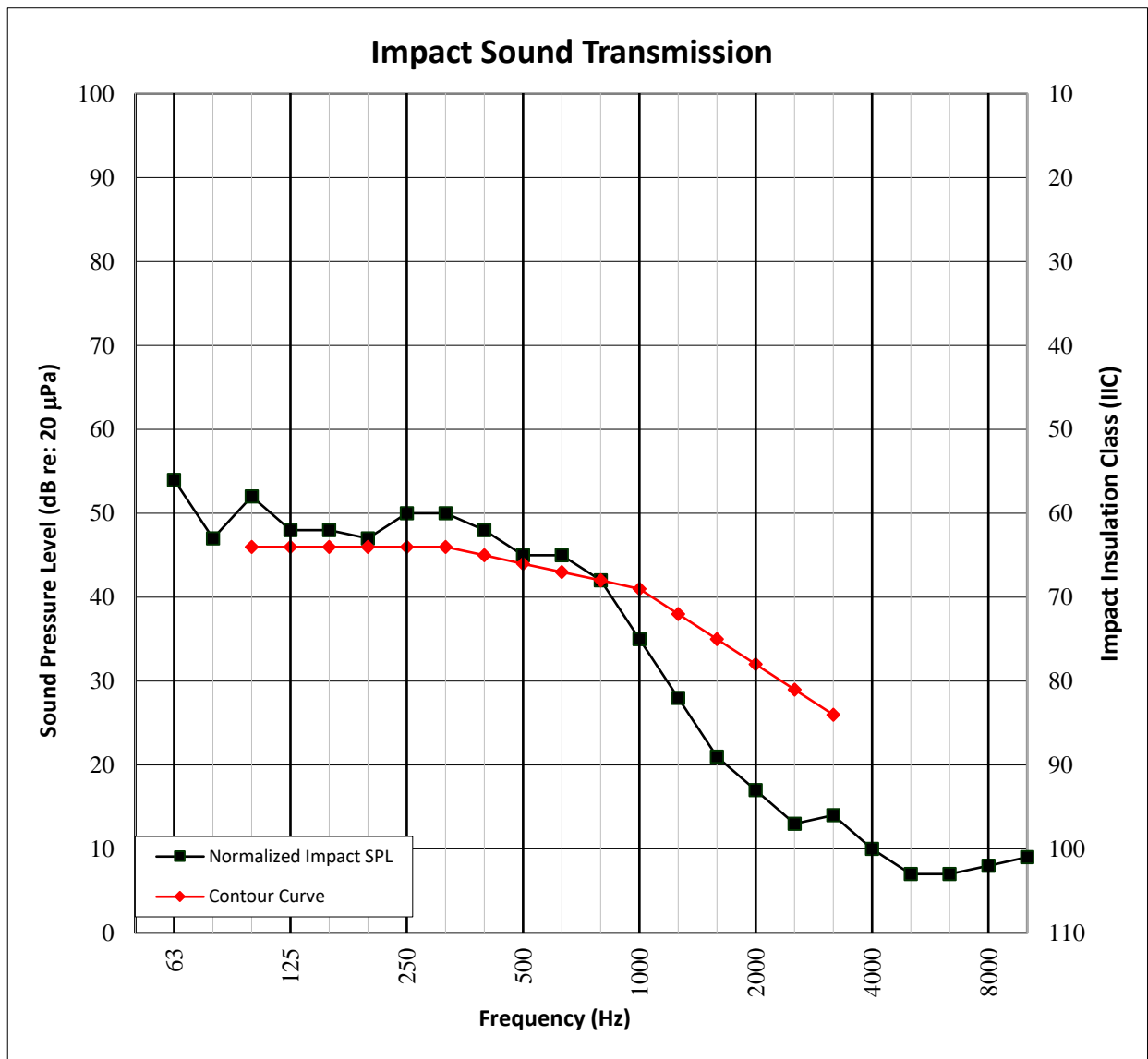
IIC Rating **66** *(Impact Insulation Class)*

Deficiencies **25** *(Sum of Deficiencies)*

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

IMPACT SOUND TRANSMISSION
ASTM E 492

Test Date	05/19/17
Data File No.	H1810.04
Client	Amorim Cork Composites
Description	3 mm (0.12") Flexco Premium Wood Vinyl Plank, 1.9 mm (0.07") AcustiCORK® ECOx2 Sound Reduction Underlayment for LVT Plank Flooring, 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 Kraft Faced R-13 Fiberglass Insulation, 15.9 mm (0.63") National Gypsum Gold Bond® Fire-Shield® Type X
Specimen Area	10.98 m ²
Technician	Daniel B. Mohler



Photographs

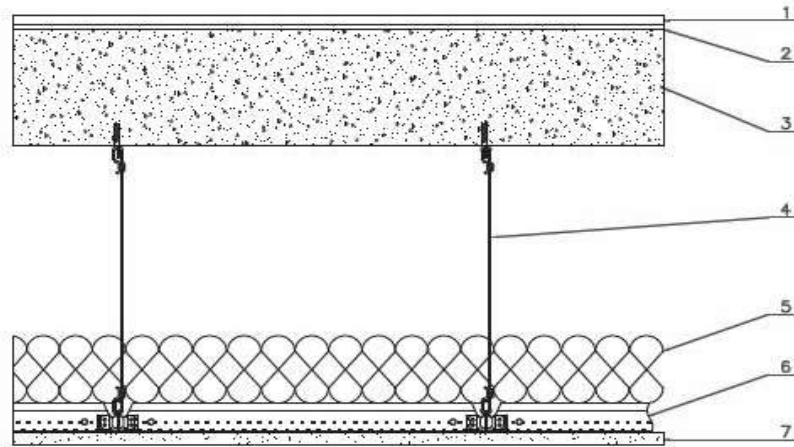


Source Room View of Test Specimen Installation



Receive Room View of Test Specimen Installation

Drawing



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