



**H1810.16-113-11-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: Open Web Truss - 457 mm (18")**

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

<b>STC</b>	<b>58</b>
<b>IIC</b>	<b>52</b>

**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  
Subfloor Topping: 19.05 mm (0.75") USG Levelrock® 2500 Floor Underlayment  
Subfloor: 17.64 mm (0.69") Oriented Strand Board Sheathing  
Insulation: 88.9 mm (3.5") Johns Manville Unfaced R-13 Fiberglass Insulation  
Truss: 457.2 mm (18") York PB Truss L/360 Open Web Truss  
Ceiling Isolation: 12.7 mm (0.5") ClarkDietrich RC Deluxe™ Resilient Channel  
Ceiling: 15.9 mm (0.63") USG SHEETROCK® Brand FIRECODE® C Core Gypsum Board

Reference should be made to Intertek-ATI Report H1810.16-113-11 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** H1810.16-113-11  
**Test Date** 07/07/17  
**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 (Open Web Truss - 457 mm (18")) 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	23°C (73.4°F)	Minimum Temperature	24.9°C (76.9°F)
Maximum Temperature	23.2°C (73.7°F)	Maximum Temperature	25°C (77°F)
Minimum Relative Humidity	62%	Minimum Relative Humidity	62%
Maximum Relative Humidity	63%	Maximum Relative Humidity	63%

### 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 <sup>2</sup> 118.19 ft <sup>2</sup>	4.51 kg/m <sup>2</sup> 0.92 lb/ft <sup>2</sup>
	<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 <sup>2</sup> 118.19 ft <sup>2</sup>	0.69 kg/m <sup>2</sup> 0.14 lb/ft <sup>2</sup>
	<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>				
Floor Underlayment	3023 by 3632 119 by 143	19.1 / 0.75	USG Levelrock® 2500	10.98 m <sup>2</sup> 118.19 ft <sup>2</sup>	40.65 kg/m <sup>2</sup> 8.33 lb/ft <sup>2</sup>
	<i>Note: Poured directly on top of the subfloor, cured a minimum of 14 days.</i>				
Oriented Strand Board Sheathing	1219 by 2438 48 by 96	17.6 / 0.69	N/A	10.98 m <sup>2</sup> 118.19 ft <sup>2</sup>	11.65 kg/m <sup>2</sup> 2.39 lb/ft <sup>2</sup>
	<i>Note: The OSB was adhered to the trusses with DAP® subfloor adhesive. It was attached with 9D nails on 203 mm (8") centers along perimeter and 305 mm (12") centers along trusses.</i>				

**Test Specimen Materials and Installation Details (Continued)**

Material	Dimensions (mm/inch)	Thickness (mm/inch)	Manufacturer and Series	Quantity	Average Weight
Fiberglass Insulation	520.7 by 3023 20.5 by 119	88.9 / 3.5	Johns Manville Unfaced R-13	10.98 m <sup>2</sup> 118.19 ft <sup>2</sup>	1.21 kg/m <sup>2</sup> 0.25 lb/ft <sup>2</sup>
	<i>Note: Installed in the cavity between trusses flush with the OSB. Hanger wire was used to keep insulation secure on 305 mm (12") centers.</i>				
Open Web Truss	88.9 by 2934 3.5 by 115.5	457.2 / 18	York PB Truss L/360	7 trusses	19.05 kg/truss 42 lb/truss
	<i>Note: Installed on 610 mm (24") centers using JUS414 hanger brackets.</i>				
Resilient Channel	68.6 by 2902 2.7 by 114.3	12.7 / 0.5	ClarkDietrich RC Deluxe™	23.2 lin m 76.12 lin ft	0.03 kg/m 0.02 lb/ft
	<i>Note: Installed on 406 mm (16") centers perpendicular to the trusses. The measured thickness of the metal was 0.7 mm (0.03").</i>				
Gypsum Board	1219 by 3023 48 by 119	15.9 / 0.63	USG SHEETROCK® Brand FIRECODE® C Core	10.35 m <sup>2</sup> 111.41 ft <sup>2</sup>	11.65 kg/m <sup>2</sup> 2.39 lb/ft <sup>2</sup>
	<i>Note: Fastened to resilient channels with 25.4 mm (1") screws spaced on 305 mm (12") centers. Seams and perimeter sealed with acoustical caulk, seams covered with pressure-sensitive tape.</i>				

**Comments**

The total weight of the floor/ceiling assembly was 899.3 kg / 1983.5 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 H1810.08-113-11.

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.

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FOR INTERTEK-ATI:

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Daniel B. Mohler  
Project Lead - Acoustical Testing

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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. H1810.08-113-11 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 <sup>3</sup> (5500.85 ft <sup>3</sup> )
VT Source Room Volume	190 m <sup>3</sup> (6709.79 ft <sup>3</sup> )



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**AIRBORNE SOUND TRANSMISSION LOSS**

ASTM E 90

<b>Test Date</b>	07/07/17
<b>Data File No.</b>	H1810.08
<b>Client</b>	Amorim Cork Composites
<b>Description</b>	3 mm (0.12") Flexco Premium Wood Vinyl Plank, 1.9 mm (0.07") AcoustiCORK® ECOx2 Sound Reduction Underlayment for LVT Plank Flooring, 19.05 mm (0.75") USG Levelrock® 2500 Floor Underlayment, 17.64 mm (0.69") Oriented Strand Board Sheathing, 88.9 mm (3.5") Johns Manville Unfaced R-13 Fiberglass Insulation, 457.2 mm (18") York PB Truss L/360 Open Web Truss, 12.7 mm (0.5") ClarkDietrich RC Deluxe™ Resilient Channel, 15.9 mm (0.63") USG SHEETROCK® Brand FIRECODE® C Core Gypsum Board
<b>Specimen Area</b>	10.98 m <sup>2</sup>
<b>Technician</b>	Daniel B. Mohler

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	40.9	33.6	101	63	33	3.70	-
63	37.5	25.3	102	63	36	4.20	-
80	33.6	17.4	110	67	41	4.20	-
100	29.9	12.4	106	71	35	3.10	-
125	32.9	9.2	105	64	42	1.20	0
160	26.9	9.5	105	62	44	1.10	1
200	25.9	9.9	103	55	48	1.30	0
250	29.5	9.8	101	53	49	1.20	2
315	23.3	9.4	105	55	51	1.40	3
400	22.3	8.2	102	51	52	0.60	5
500	23.1	7.4	101	47	55	0.40	3
630	22.5	7.3	100	45	57	0.60	2
800	21.5	7.4	100	45	57	0.40	3
1000	21.2	7.5	100	44	57	0.40	4
1250	19.6	7.4	98	39	61	0.40	1
1600	17.9	7.8	99	36	64	0.60	0
2000	14.9	8.7	99	36	64	0.50	0
2500	12.1	9.4	95	31	64	0.70	0
3150	11.3	9.9	97	29	68	1.00	0
4000	8.8	11.0	97	25	72	1.30	0
5000	8.0	12.3	94	20	74	1.20	-
6300	7.9	14.4	92	14	76	1.10	-
8000	7.3	18.5	93	11	79	1.30	-
10000	7.1	21.4	91	8	80	0.90	-

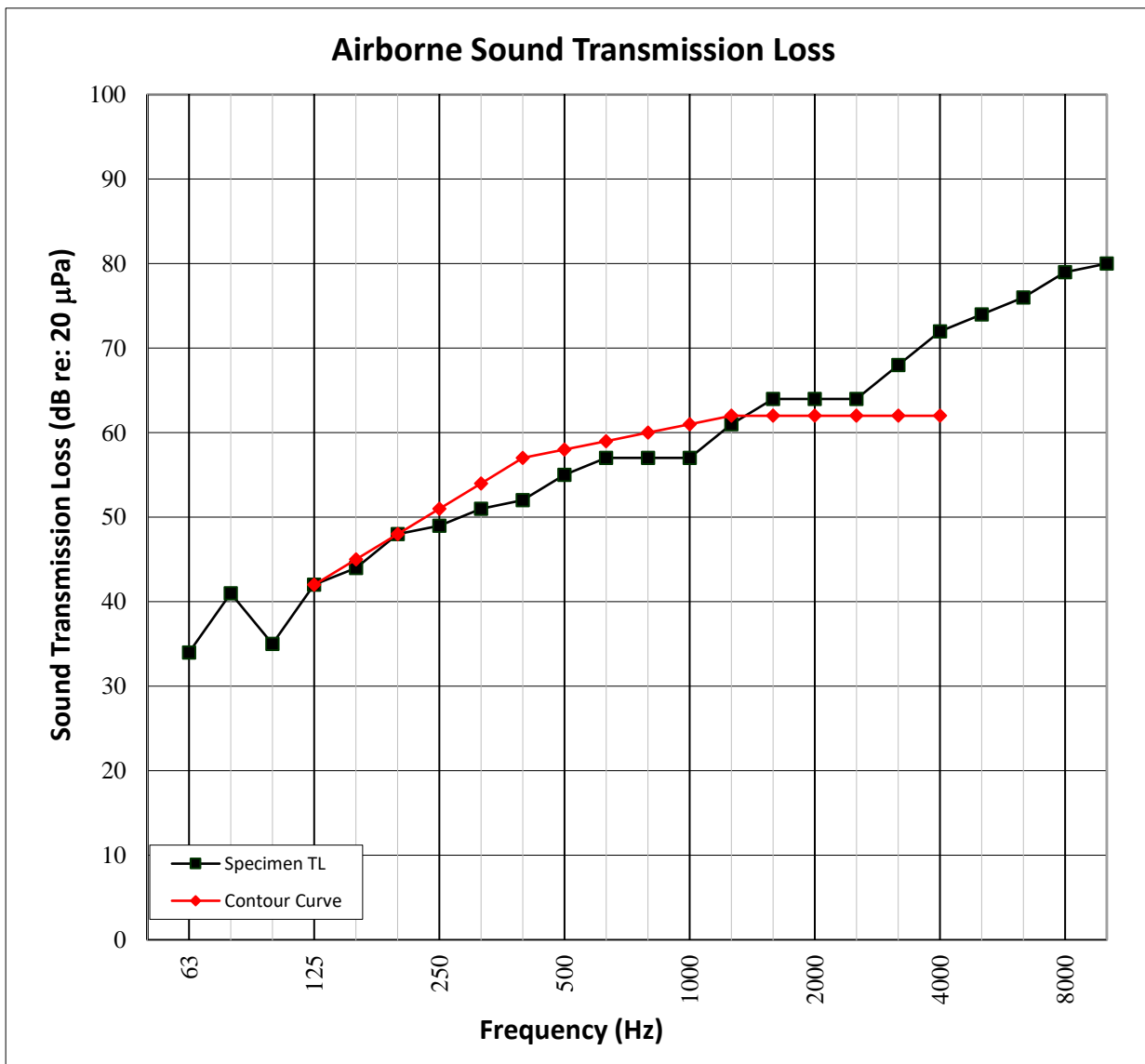
**STC Rating**      **58**      *(Sound Transmission Class)*Deficiencies      24      *(Sum of Deficiencies)*

- 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

<b>Test Date</b>	07/07/17
<b>Data File No.</b>	H1810.08
<b>Client</b>	Amorim Cork Composites
<b>Description</b>	3 mm (0.12") Flexco Premium Wood Vinyl Plank, 1.9 mm (0.07") AcoustiCORK® ECOx2 Sound Reduction Underlayment for LVT Plank Flooring, 19.05 mm (0.75") USG Levelrock® 2500 Floor Underlayment, 17.64 mm (0.69") Oriented Strand Board Sheathing, 88.9 mm (3.5") Johns Manville Unfaced R-13 Fiberglass Insulation, 457.2 mm (18") York PB Truss L/360 Open Web Truss, 12.7 mm (0.5") ClarkDietrich RC Deluxe™ Resilient Channel, 15.9 mm (0.63") USG SHEETROCK® Brand FIRECODE® C Core Gypsum Board
<b>Specimen Area</b>	10.98 m <sup>2</sup>
<b>Technician</b>	Daniel B. Mohler





H1810.16-113-11-R0



**IMPACT SOUND TRANSMISSION**  
ASTM E 492

<b>Test Date</b>	07/07/17
<b>Data File No.</b>	H1810.08
<b>Client</b>	Amorim Cork Composites
<b>Description</b>	3 mm (0.12") Flexco Premium Wood Vinyl Plank, 1.9 mm (0.07") AcoustiCORK® ECOx2 Sound Reduction Underlayment for LVT Plank Flooring, 19.05 mm (0.75") USG Levelrock® 2500 Floor Underlayment, 17.64 mm (0.69") Oriented Strand Board Sheathing, 88.9 mm (3.5") Johns Manville Unfaced R-13 Fiberglass Insulation, 457.2 mm (18") York PB Truss L/360 Open Web Truss, 12.7 mm (0.5") ClarkDietrich RC Deluxe™ Resilient Channel, 15.9 mm (0.63") USG SHEETROCK® Brand FIRECODE® C Core Gypsum Board
<b>Specimen Area</b>	10.98 m <sup>2</sup>
<b>Technician</b>	Daniel B. Mohler

Freq (Hz)	Background SPL (dB)	Absorption (m <sup>2</sup> )	Normalized Impact SPL (dB)	95% Confidence Limit	Number of Deficiencies
50	37.4	40.7	68	2.3	-
63	36.3	24.3	62	2.2	-
80	32.6	16.8	63	1.1	-
100	33.0	11.5	63	1.2	3
125	33.0	9.8	65	1.5	5
160	27.0	9.5	65	0.8	5
200	26.0	9.7	65	0.7	5
250	29.2	9.6	64	0.9	4
315	23.5	9.8	65	0.4	5
400	21.9	8.1	61	0.5	2
500	22.1	7.5	58	0.4	0
630	21.4	7.2	54	0.4	0
800	23.5	7.3	49	0.3	0
1000	23.8	7.6	42	0.2	0
1250	19.8	7.4	36	0.3	0
1600	18.2	7.7	33	0.2	0
2000	15.4	8.6	35	0.2	0
2500	12.2	9.4	33	0.2	0
3150	11.0	10.0	27	0.3	0
4000	8.6	10.9	21	0.4	-
5000	8.1	12.3	15	0.4	-
6300	7.6	14.3	11	0.4	-
8000	7.2	18.7	10	0.4	-
10000	7.0	21.9	10	0.4	-

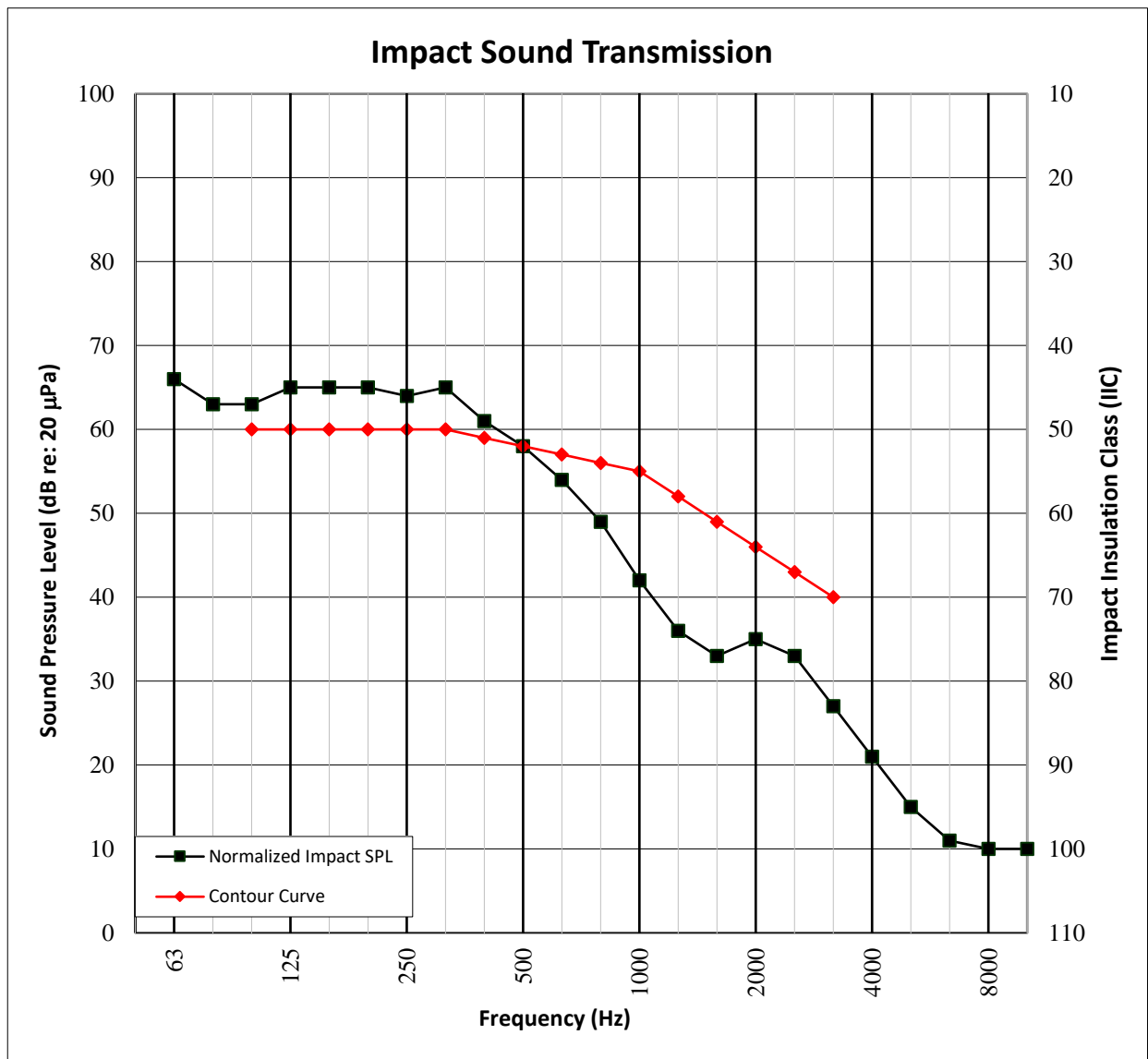
**IIC Rating**      **52**      *(Impact Insulation Class)*

**Deficiencies**      **29**      *(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

<b>Test Date</b>	07/07/17
<b>Data File No.</b>	H1810.08
<b>Client</b>	Amorim Cork Composites
<b>Description</b>	3 mm (0.12") Flexco Premium Wood Vinyl Plank, 1.9 mm (0.07") AcoustiCORK® ECOx2 Sound Reduction Underlayment for LVT Plank Flooring, 19.05 mm (0.75") USG Levelrock® 2500 Floor Underlayment, 17.64 mm (0.69") Oriented Strand Board Sheathing, 88.9 mm (3.5") Johns Manville Unfaced R-13 Fiberglass Insulation, 457.2 mm (18") York PB Truss L/360 Open Web Truss, 12.7 mm (0.5") ClarkDietrich RC Deluxe™ Resilient Channel, 15.9 mm (0.63") USG SHEETROCK® Brand FIRECODE® C Core Gypsum Board
<b>Specimen Area</b>	10.98 m <sup>2</sup>
<b>Technician</b>	Daniel B. Mohler



**Photographs**

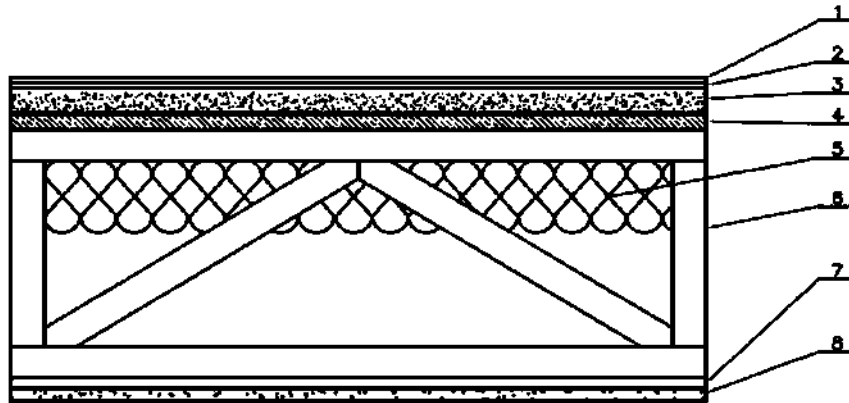


**Source Room View of Test Specimen Installation**



**Receive Room View of Test Specimen Installation**

Drawing



- 1-Floor Topping
- 2-Underlayment
- 3-Subfloor Topping
- 4-Subfloor
- 5-Insulation
- 6-Truss
- 7-Ceiling Isolation
- 8-Ceiling