

# FORMULATORS TEST REPORT

**SCOPE OF WORK**

ASTM E90, ASTM E492, AND ASTM E2179 TESTING ON  
AQUAFLEX WATERPROOF FLOORING ADHESIVE

**REPORT NUMBER**

H5025.01-113-11-R0

**TEST DATE**

08/29/17

**ISSUE DATE**

09/08/17

**RECORD RETENTION END**

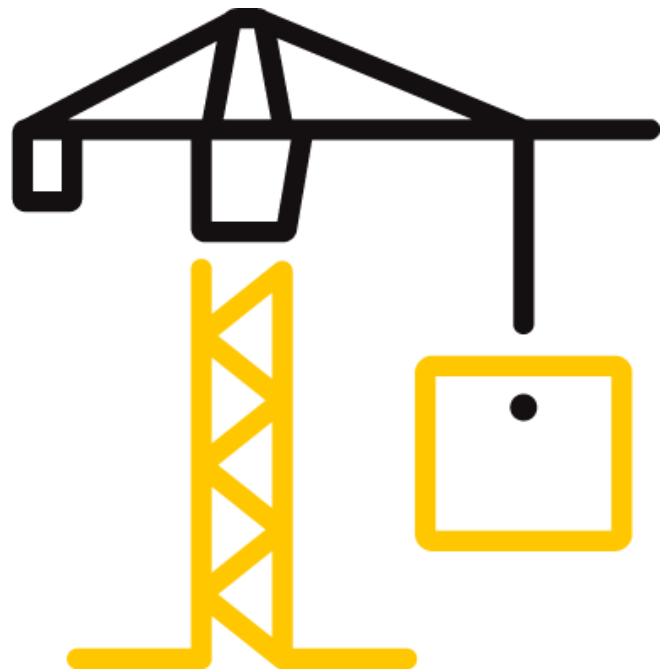
08/29/21

**PAGES**

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**DOCUMENT CONTROL**

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## TEST REPORT FOR FORMULATORS

Report No.: H5025.01-113-11-R0

Date: 09/08/17

### REPORT ISSUED TO

#### FORMULATORS

1790 Boyd Street

Santa Ana, California 92705

### SECTION 1

#### SCOPE

Intertek Building & Construction (B&C) was contracted by to perform testing in accordance with ASTM E90, ASTM E492, AND ASTM E2179 on Aquaflex Waterproof Flooring Adhesive. 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

<b>DATA FILE NO.</b>	H5025.01
<b>SERIES/MODEL:</b>	Aquaflex Waterproof Flooring Adhesive
<b>STC</b>	52
<b>IIC</b>	42
<b>ΔIIC</b>	14

**COMPLETED BY:** Jeremy L. Amend  
Technician II - Acoustical  
**TITLE:** Testing  
**SIGNATURE:**  
**DATE:** 09/08/17

**COMPLETED BY:** Jordan Strybos  
Project Manager - Acoustical  
**TITLE:** Testing  
**SIGNATURE:**  
**DATE:** 09/08/17

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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 E989-06 (2012)**, *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) 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 4080.4 kg. B&C 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.

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-1033	Data Acquisition Card	63763-1	06/16 *
Data Acquisition Unit	National Instruments	PXI-4462	Input Card	63763-4	07/16 *
Data Acquisition Unit	National Instruments	PXI-4462	Input Card	63763-5	06/16 *
Microphone Calibrator	Norsonic	1251	Pistonphone calibrator	INT00127	03/17
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	65617	05/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63744	05/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63745	05/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64340	08/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63747	05/17
Receive Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63810	10/16
				63811	10/16
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63738	04/17
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63739	04/17
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63740	04/17
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63742	04/17
Source Room Microphone	PCB Electronics	378B20	Microphone and Preamplifier	63741	04/17
Source Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63812	11/16
Tapping Machine	Look Line s.r.l.	EM50 (TM50)	Tapping Machine	65351	02/17

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

<b>VT RECEIVE ROOM VOLUME</b>	158.86 m <sup>3</sup>
<b>VT SOURCE ROOM VOLUME</b>	190 m <sup>3</sup>

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### SECTION 6

#### LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Jeremy L. Amend	Intertek B&C
Jordan Strybos	Intertek B&C

### 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 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. Four 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  $\Delta$ 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 Plank	914.4 by 152.4	2.9	TAJ Flooring	10.98 m <sup>2</sup>	5.42 kg/m <sup>2</sup>
	Note: A sheet of 2 mil polyethylene plastic was adhered to the floor slab with 3M Super 77 spray adhesive. The floor topping was adhered to the sheeting with Aquaflex Waterproof Flooring Adhesive, which was spread using a 0.79 mm by 1.59 mm by 3.57 mm U-notched trowel. Adhesive was allowed to cure per manufacturer's specifications.				
Concrete Slab	3023 by 3632	152.4	5000 PSI	10.98 m <sup>2</sup>	366.18 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.				

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### SECTION 10

#### TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS



<b>TEST DATE</b>	8/29/2017				
<b>DATA FILE NO.</b>	H5025.01				
<b>CLIENT</b>	Formulators				
<b>DESCRIPTION</b>	2.88 mm TAJ Flooring Luxury Vinyl Plank, 152.4 mm 5000 PSI Concrete Slab				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Receive Temp.</b>	22.6°C	<b>Source Temp.</b>	22.7°C
<b>TECHNICIAN</b>	JLA	<b>Receive Humidity</b>	69%	<b>Source Humidity</b>	69%

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
80	34.9	18.1	109	65	41	4.2	-
100	33.2	13.4	106	67	38	2.4	-
125	34.2	10.8	105	70	35	1.6	1
160	27.9	9.7	106	70	37	1.4	2
200	27.1	11.1	104	67	36	1.4	6
250	32.9	10.7	103	62	41	0.8	4
315	27.8	9.3	106	60	46	1.0	2
400	27.0	8.3	104	58	47	1.0	4
500	29.3	7.5	103	55	50	0.6	2
630	31.0	7.5	104	54	52	0.6	1
800	27.5	7.5	104	53	53	0.7	1
1000	27.2	7.2	103	50	55	0.5	0
1250	27.3	7.2	103	47	58	0.4	0
1600	22.9	7.3	103	43	62	0.5	0
2000	18.4	7.9	103	40	64	0.5	0
2500	14.6	8.8	101	37	65	0.6	0
3150	14.3	9.6	102	35	68	0.8	0
4000	12.2	10.8	103	33	70	0.9	0
5000	10.6	12.0	103	30	73	1.2	-
6300	9.6	14.9	96	20	75	1.4	-
8000	7.9	19.4	96	16	78	1.4	-
10000	7.4	23.6	91	9	79	1.0	-
<b>STC Rating</b>	<b>52</b> (Sound Transmission Class)				<b>Sum of Deficiencies</b>	<b>23</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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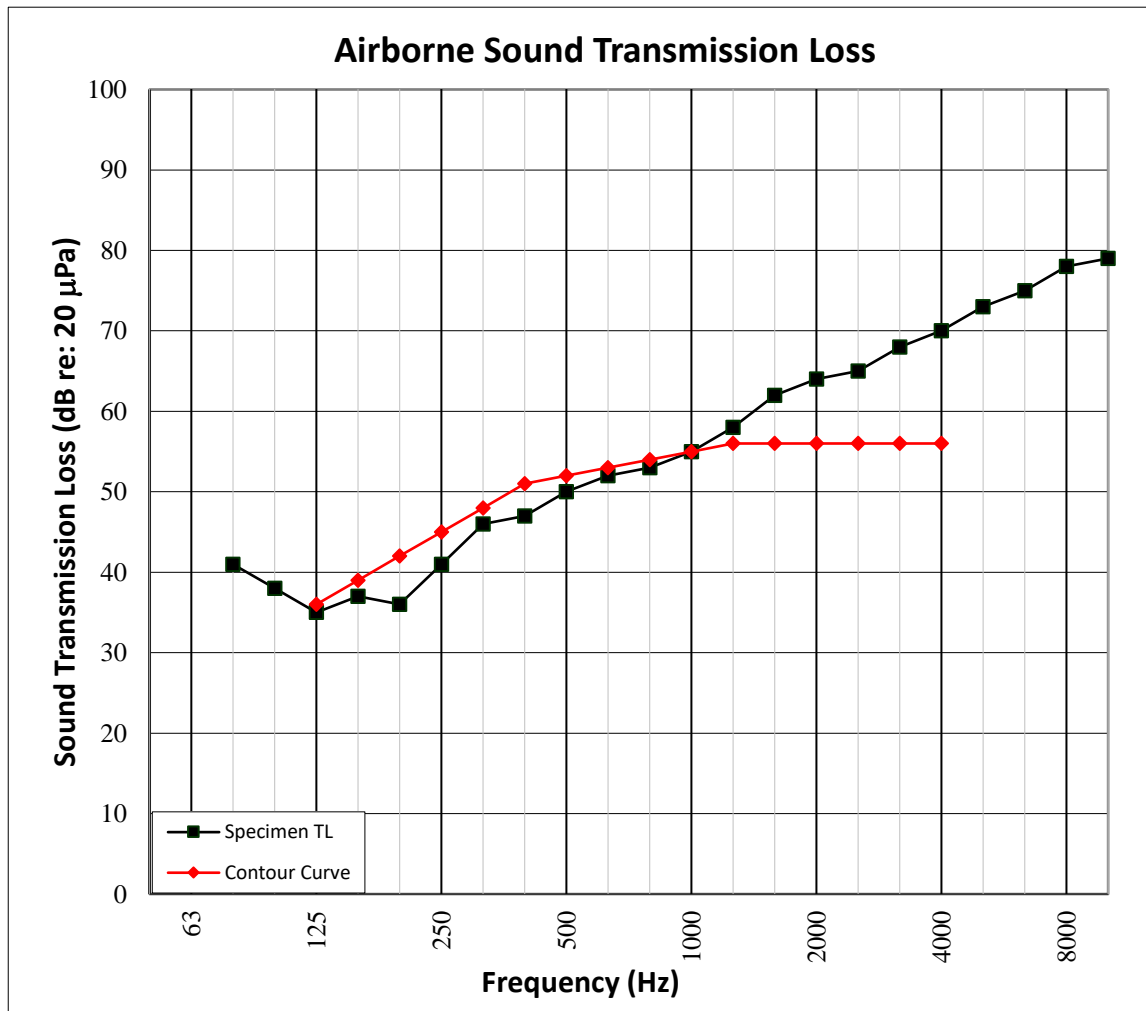
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### SECTION 11

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



<b>TEST DATE</b>	8/29/2017				
<b>DATA FILE NO.</b>	H5025.01				
<b>CLIENT</b>	Formulators				
<b>DESCRIPTION</b>	2.88 mm TAJ Flooring Luxury Vinyl Plank, 152.4 mm 5000 PSI Concrete Slab				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Receive Temp.</b>	22.6°C	<b>Source Temp.</b>	22.7°C
<b>TECHNICIAN</b>	JLA	<b>Receive Humidity</b>	69%	<b>Source Humidity</b>	69%





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### SECTION 12

#### TEST RESULTS - IMPACT SOUND TRANSMISSION



<b>TEST DATE</b>	8/29/2017				
<b>DATA FILE NO.</b>	H5025.01				
<b>CLIENT</b>	Formulators				
<b>DESCRIPTION</b>	2.88 mm TAJ Flooring Luxury Vinyl Plank, 152.4 mm 5000 PSI Concrete Slab				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Maximum Temp.</b>	22.6°C	<b>Minimum Temp.</b>	22.6°C
<b>TECHNICIAN</b>	JLA	<b>Max. Humidity</b>	69%	<b>Min. Humidity</b>	69%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m <sup>2</sup>	NORMALIZED IMPACT SPL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
50	41.4	31.6	59	3.1	-
63	36.9	42.2	56	2.8	-
80	35.9	18.2	56	2.6	-
100	32.2	13.8	57	1.0	0
125	32.6	9.9	57	1.0	0
160	27.9	9.4	63	1.3	0
200	26.4	10.7	66	0.5	0
250	31.3	11.0	68	1.0	0
315	26.3	9.4	66	0.6	0
400	26.6	8.2	66	0.5	0
500	29.6	7.7	65	0.5	0
630	29.3	7.4	65	0.2	0
800	27.8	7.4	65	0.5	0
1000	27.7	7.1	65	0.3	0
1250	25.2	7.3	64	0.3	2
1600	22.4	7.4	63	0.4	4
2000	17.6	7.9	62	0.5	6
2500	14.9	8.7	60	0.7	7
3150	13.9	9.4	58	0.6	8
4000	11.9	10.7	54	0.8	-
5000	9.8	12.0	49	1.0	-
6300	8.8	15.0	40	1.6	-
8000	7.5	19.4	28	2.2	-
10000	7.2	23.1	20	1.8	-
<b>IIC Rating</b>	<b>42</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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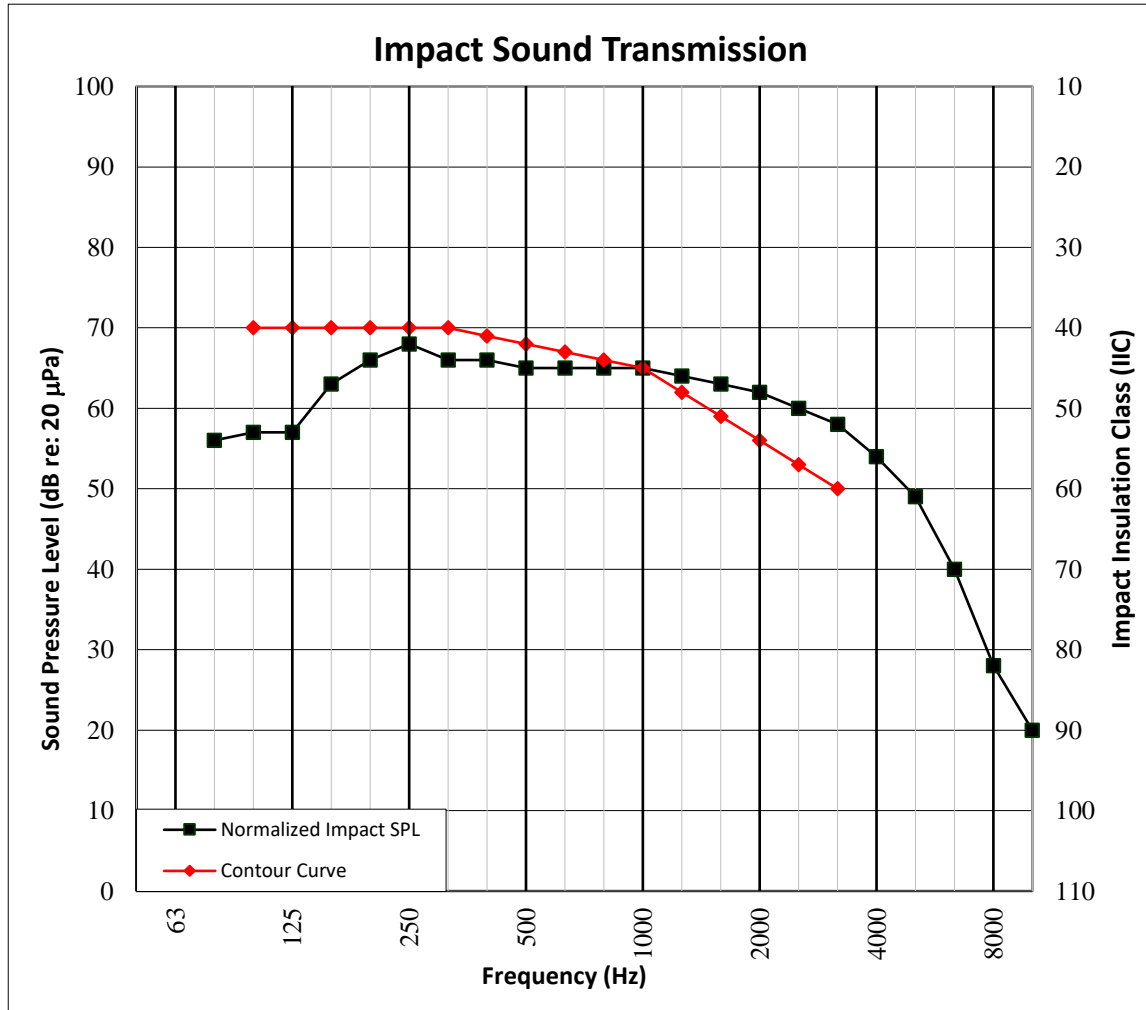
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### SECTION 13

### TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH



<b>TEST DATE</b>	8/29/2017				
<b>DATA FILE NO.</b>	H5025.01				
<b>CLIENT</b>	Formulators				
<b>DESCRIPTION</b>	2.88 mm TAJ Flooring Luxury Vinyl Plank, 152.4 mm 5000 PSI Concrete Slab				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Maximum Temp.</b>	22.6°C	<b>Minimum Temp.</b>	22.6°C
<b>TECHNICIAN</b>	JLA	<b>Max. Humidity</b>	69%	<b>Min. Humidity</b>	69%



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### SECTION 14

#### TEST RESULTS - DELTA IMPACT INSULATION



<b>TEST DATE</b>	8/29/2017				
<b>DATA FILE NO.</b>	H5025.01				
<b>CLIENT</b>	Formulators				
<b>DESCRIPTION</b>	2.88 mm TAJ Flooring Luxury Vinyl Plank, 152.4 mm 5000 PSI Concrete Slab				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Maximum Temp.</b>	22.6°C	<b>Minimum Temp.</b>	22.6°C
<b>TECHNICIAN</b>	JLA	<b>Max. Humidity</b>	69%	<b>Min. Humidity</b>	69%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m <sup>2</sup>	NORMALIZED IMPACT SPL BARE (dB)	95% CONF LIMIT	NORMALIZED IMPACT SPL SPEC (dB)	95% CONF LIMIT	RESULT ARRAY L <sub>ref,c</sub>	NUMBER OF DEFICIENCIES
100	32.2	13.8	60.3	2.0	57.4	1.2	64.0	0
125	32.6	9.9	59.2	1.6	57.4	1.3	66.0	0
160	27.9	9.4	64.8	1.2	63.0	1.7	66.0	0
200	26.4	10.7	69.0	0.9	65.8	0.7	65.0	0
250	31.3	11.0	70.1	1.0	67.7	1.2	67.0	0
315	26.3	9.4	68.7	0.7	66.2	0.8	67.0	0
400	26.6	8.2	68.8	0.6	66.0	0.7	67.0	0
500	29.6	7.7	67.7	0.5	64.7	0.7	67.0	0
630	29.3	7.4	69.2	0.3	65.2	0.3	67.0	0
800	27.8	7.4	70.3	0.5	65.3	0.6	66.0	0
1000	27.7	7.1	70.6	0.3	64.6	0.4	66.0	1
1250	25.2	7.3	71.4	0.3	63.6	0.4	64.0	2
1600	22.4	7.4	71.9	0.5	63.2	0.5	63.0	4
2000	17.6	7.9	72.7	0.5	62.3	0.6	62.0	6
2500	14.9	8.7	73.5	0.8	60.2	0.9	59.0	6
3150	13.9	9.4	73.0	0.7	57.5	0.7	57.0	7

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

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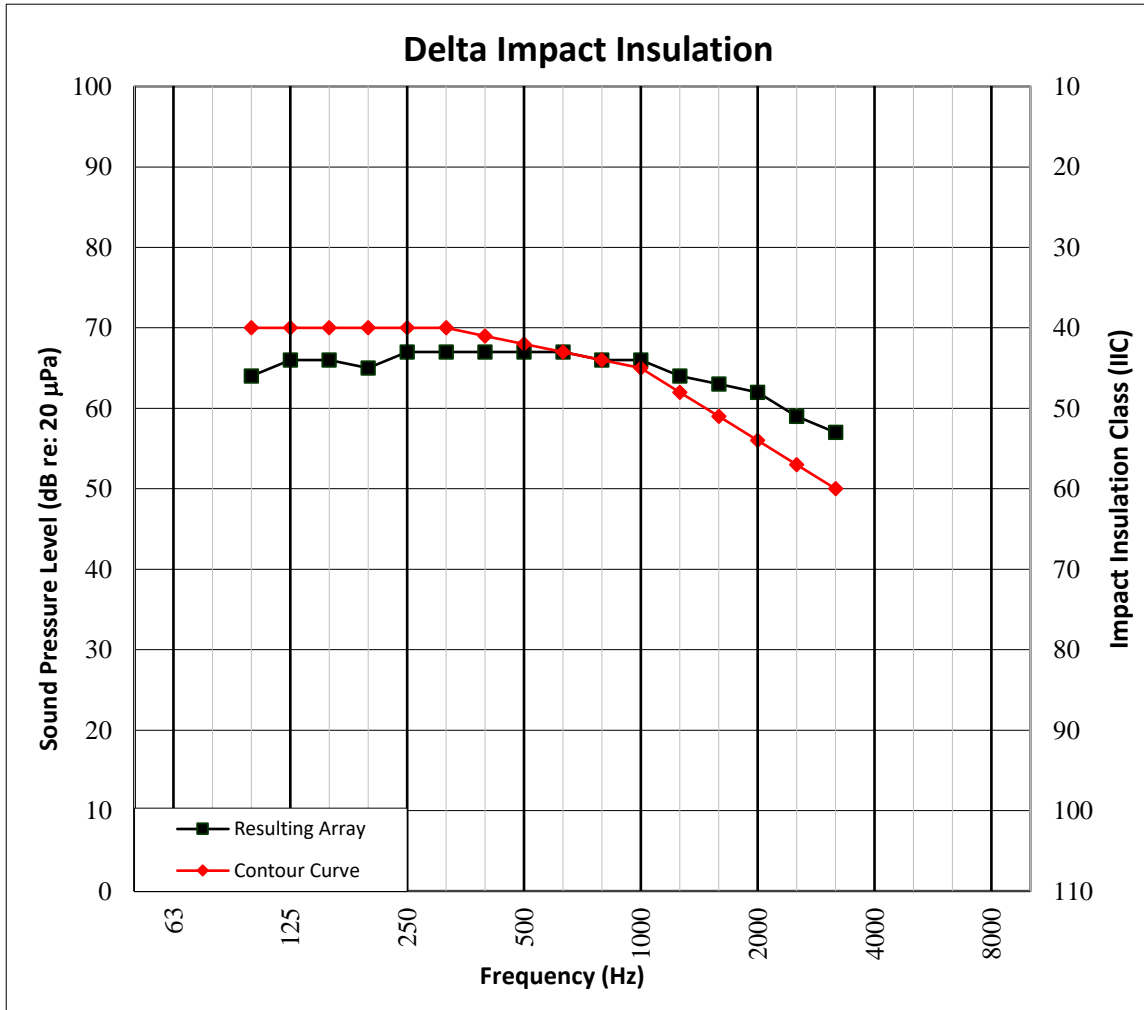
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### SECTION 15

### TEST RESULTS - DELTA IMPACT INSULATION GRAPH



<b>TEST DATE</b>	8/29/2017				
<b>DATA FILE NO.</b>	H5025.01				
<b>CLIENT</b>	Formulators				
<b>DESCRIPTION</b>	2.88 mm TAJ Flooring Luxury Vinyl Plank, 152.4 mm 5000 PSI Concrete Slab				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Maximum Temp.</b>	22.6°C	<b>Minimum Temp.</b>	22.6°C
<b>TECHNICIAN</b>	JLA	<b>Max. Humidity</b>	69%	<b>Min. Humidity</b>	69%



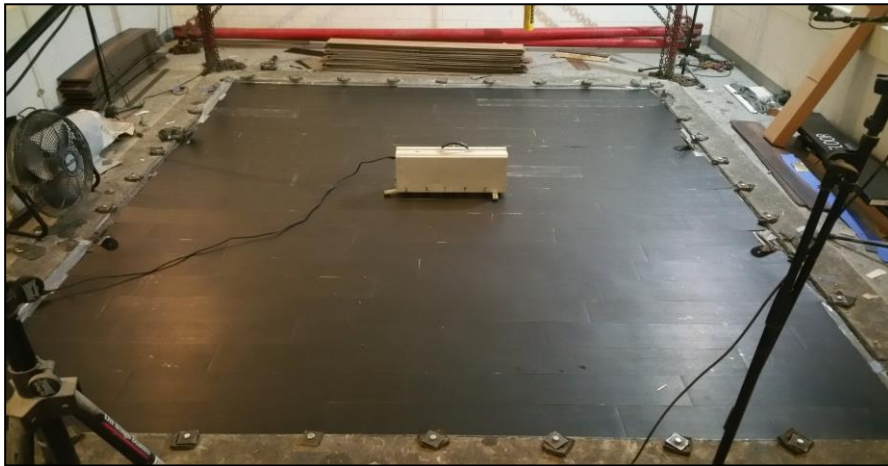
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**SECTION 16**

**PHOTOGRAPHS**



**Source Room View of Test Specimen Installation**



**Receive Room View of Test Specimen Installation**

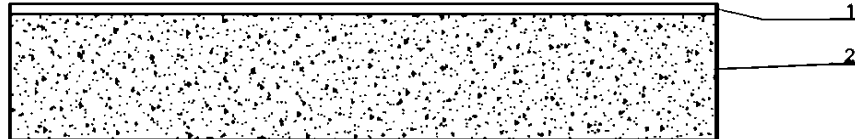
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**SECTION 17**

**DRAWING**



1-Floor Topping  
2-Concrete Slab

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**SECTION 18**

**REVISION LOG**

REVISION #	DATE	PAGES	REVISION
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