



D8974.04-113-11-R0
ACOUSTICAL PERFORMANCE TEST REPORT
ASTM E 90, ASTM E 492, ASTM E 2179

Rendered to

REGUPOL AMERICA

Series/Model: Regupol® Sonus™ LV270 2mm Underlayment

Specimen Type: Floor/Ceiling Assembly

Overall Size: 3023 mm by 3632 mm

STC	51
IIC	52
ΔIIC	22

Test Specimen Identification:

Floor Topping: 2.4 mm Luxury Vinyl Plank

Underlayment: Regupol® Sonus™ LV270 2mm Underlayment

Floor Slab: 152 mm Concrete Slab

Reference should be made to Architectural Testing, Inc. Report D8974.04-113-11 for complete test specimen description.



Acoustical Performance Test Report

REGUPOL AMERICA
33 Keystone Drive
Lebanon , Pennsylvania 17042

Report	D8974.04-113-11
Test Date	06/17/14
Report Date	09/11/14
Record Retention End Date	06/17/18

Project Scope

Regupol America contracted Architectural Testing to conduct airborne sound transmission loss, impact sound transmission, and delta impact insulation tests. A summary of the results is listed in the Test Results section, and the complete test data is included as attachments to this report. The client provided the test specimen.

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, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions

ASTM E 413-10, Classification for Rating Sound Insulation

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

ASTM E 2179-03 (2009), Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete

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 Architectural Testing, Inc. 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 twenty sound absorption measurements were conducted at each of five microphone positions.

Test Procedure (Continued)

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 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 twenty sound absorption measurements were conducted at each of five microphone positions.

The delta impact insulation test was conducted in accordance with ASTM E 2179 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 E 492 with only the concrete slab installed.

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

Test Conditions

Source Room		Receive Room	
Maximum Temperature	23.1 °C	Maximum Temperature	21.8 °C
Minimum Temperature	23.1 °C	Minimum Temperature	21.8 °C
Average Temperature	23.1 °C	Average Temperature	21.8 °C
Maximum Relative Humidity	60%	Maximum Relative Humidity	63%
Minimum Relative Humidity	60%	Minimum Relative Humidity	63%
Average Relative Humidity	60%	Average Relative Humidity	63%

Test Calculations

The STC (Sound Transmission Class), IIC (Impact Insulation Class), and ΔIIC (Delta Impact Insulation Class) ratings were calculated in accordance with ASTM E 413, ASTM E 989, ASTM E 2179, respectively.

Test Specimen Materials and Installation Details

Material	Dimensions (mm)	Thickness (mm)	Manufacturer and Series	Quantity	Average Weight
Luxury Vinyl Plank	101.6 by 914.4	2.4	N/A	10.98 m ²	4.3 kg/m ²
<i>Note: The floor topping was installed with an acrylic adhesive using a 1.59 mm v-notched trowel.</i>					
Regupol® Sonus™ LV270 2mm Underlayment	1219.2 by 3632	2.7	Regupol	10.98 m ²	1.25 kg/m ²
<i>Note: The underlayment was placed onto the concrete slab with a releasable adhesive.</i>					

Test Specimen Materials and Installation Details

Material	Dimensions (mm)	Thickness (mm)	Manufacturer and Series	Quantity	Average Weight
Concrete Slab	3023 by 3632	152.0	N/A	10.98 m ²	366.18 kg/m ²
	<i>Note: The concrete slab was installed into a test frame flush to the source room.</i>				

Comments

The total weight of the floor/ceiling assembly was 4081.6 kg. Architectural Testing will store samples of the test specimen for four years. Photographs of the test specimen are included in the attachments. A drawings is included in the attachments.

Architectural Testing 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 Architectural Testing for the entire test record retention period.

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 may not be reproduced, except in full, without the written approval of Architectural Testing.

For ARCHITECTURAL TESTING, INC:

Daniel B. Mohler
Technician II - Acoustical Testing

Bradlay D. Hunt
Project Manager - Acoustical Testing

Attachments (9)

* Stated by Client/Manufacturer

N/A - Non Applicable



Revision Log

<u>Revision</u>	<u>Date</u>	<u>Page(s)</u>	<u>Description</u>
R0	09/11/14	N/A	Original Report Issue

Attachments

Instrumentation

Instrument	Manufacturer	Model	ATI Number	Date of Calibration
Data Acquisition Unit	National Instruments	PXI-1033	63763	06/14 *
Source Room Microphone	PCB Piezotronics	378B20	63738	04/14
Source Room Microphone	PCB Piezotronics	378B20	63739	04/14
Source Room Microphone	PCB Piezotronics	378B20	63748	04/14
Source Room Microphone	PCB Piezotronics	378B20	63742	04/14
Source Room Microphone	PCB Piezotronics	378B20	63741	04/14
Receive Room Microphone	PCB Piezotronics	378B20	64340	04/14
Receive Room Microphone	PCB Piezotronics	378B20	63744	04/14
Receive Room Microphone	PCB Piezotronics	378B20	63745	04/14
Receive Room Microphone	PCB Piezotronics	378B20	63746	04/14
Receive Room Microphone	PCB Piezotronics	378B20	63747	04/14
Receive Room Environmental Indicator	Comet	T7510	63810	09/13
Receive Room Environmental Indicator	Comet	T7510	63811	09/13
Source Room Environmental Indicator	Comet	T7510	63812	09/13
Microphone Calibrator	Norsonic	1251	Y002919	06/14
Tapping Machine	Norsonic	N-211	Y003242	03/14

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

Test Chambers

VT Receive Room Volume	158.9 m ³
VT Source Room Volume	190 m ³



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AIRBORNE SOUND TRANSMISSION LOSS
ASTM E 90

Test Date	06/17/14
Data File No.	D8974.04
Client	Regupol America
Description	2.4 mm Luxury Vinyl Plank, Regupol® Sonus™ LV270 2mm Underlayment, 152 mm Concrete Slab
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
80	58.9	14.7	102	63	40	7.60	-
100	41.9	11.7	101	61	40	3.50	-
125	37.0	9.5	97	62	36	2.40	0
160	31.6	8.8	95	59	37	2.20	1
200	28.7	10.4	94	58	37	1.20	4
250	27.2	10.3	97	57	40	1.40	4
315	26.8	8.9	96	56	41	1.30	6
400	25.6	7.6	94	53	43	1.30	7
500	25.4	7.2	95	51	45	0.80	6
630	23.5	6.7	96	50	49	1.00	3
800	23.4	7.0	96	47	52	1.00	1
1000	23.3	7.0	96	41	57	0.50	0
1250	22.8	6.9	96	41	58	0.70	0
1600	18.6	7.0	96	38	61	0.40	0
2000	12.4	7.8	97	35	64	0.60	0
2500	8.2	8.6	96	32	66	0.60	0
3150	7.9	9.4	96	30	67	0.50	0
4000	7.2	10.8	97	29	67	0.70	0
5000	7.6	12.3	97	26	70	0.80	-
6300	7.0	15.4	91	15	76	0.90	-
8000	7.1	20.2	90	12	77	0.80	-
10000	7.2	25.8	86	8	76	0.80	-

STC Rating **51** (*Sound Transmission Class*)
Deficiencies **32** (*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 indicate the lower limit of the transmission loss.
3) Specimen TL levels listed in green indicate that there has been a filler wall correction applied

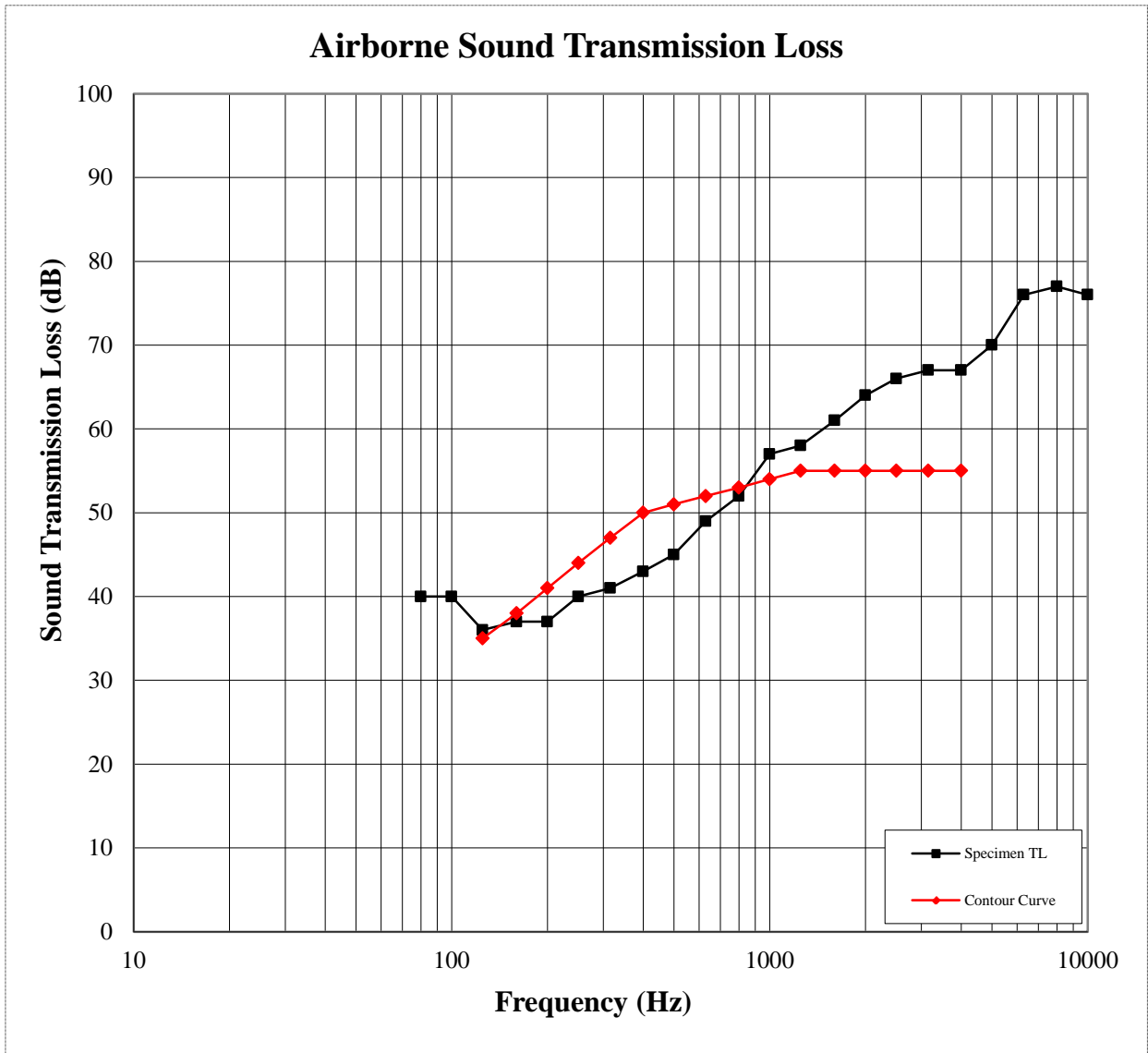


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AIRBORNE SOUND TRANSMISSION LOSS ASTM E 90

Test Date	06/17/14
Data File No.	D8974.04
Client	Regupol America
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Specimen Area	10.98 m ²
Technician	Daniel B. Mohler





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IMPACT SOUND TRANSMISSION
ASTM E 492

Test Date	06/17/14
Data File No.	D8974.04
Client	Regupol America
Description	2.4 mm Luxury Vinyl Plank, Regupol® Sonus™ LV270 2mm Underlayment, 152 mm Concrete Slab
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
80	59.8	16.4	60	3.3	-
100	42.9	13.3	57	2.9	0
125	36.6	10.4	58	1.1	0
160	31.7	9.5	62	4.3	2
200	27.8	11.1	67	2.0	7
250	26.7	10.9	66	1.9	6
315	26.3	9.4	65	2.8	5
400	25.1	8.3	64	1.6	5
500	24.3	7.8	62	1.7	4
630	22.4	7.3	59	1.9	2
800	22.6	7.5	56	4.9	0
1000	22.5	7.4	48	4.7	0
1250	22.4	7.4	38	4.0	0
1600	18.7	7.4	34	1.2	0
2000	12.0	8.3	30	2.8	0
2500	8.0	9.2	22	2.2	0
3150	7.1	10.1	18	1.1	0
4000	7.2	11.6	14	0.7	-
5000	7.0	13.1	9	0.6	-
6300	6.9	16.5	8	0.5	-
8000	7.1	21.5	9	0.4	-
10000	7.2	27.5	10	0.5	-

IIC Rating **52** *(Impact Insulation Class)*
Deficiencies **31** *(Sum of Deficiencies)*

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

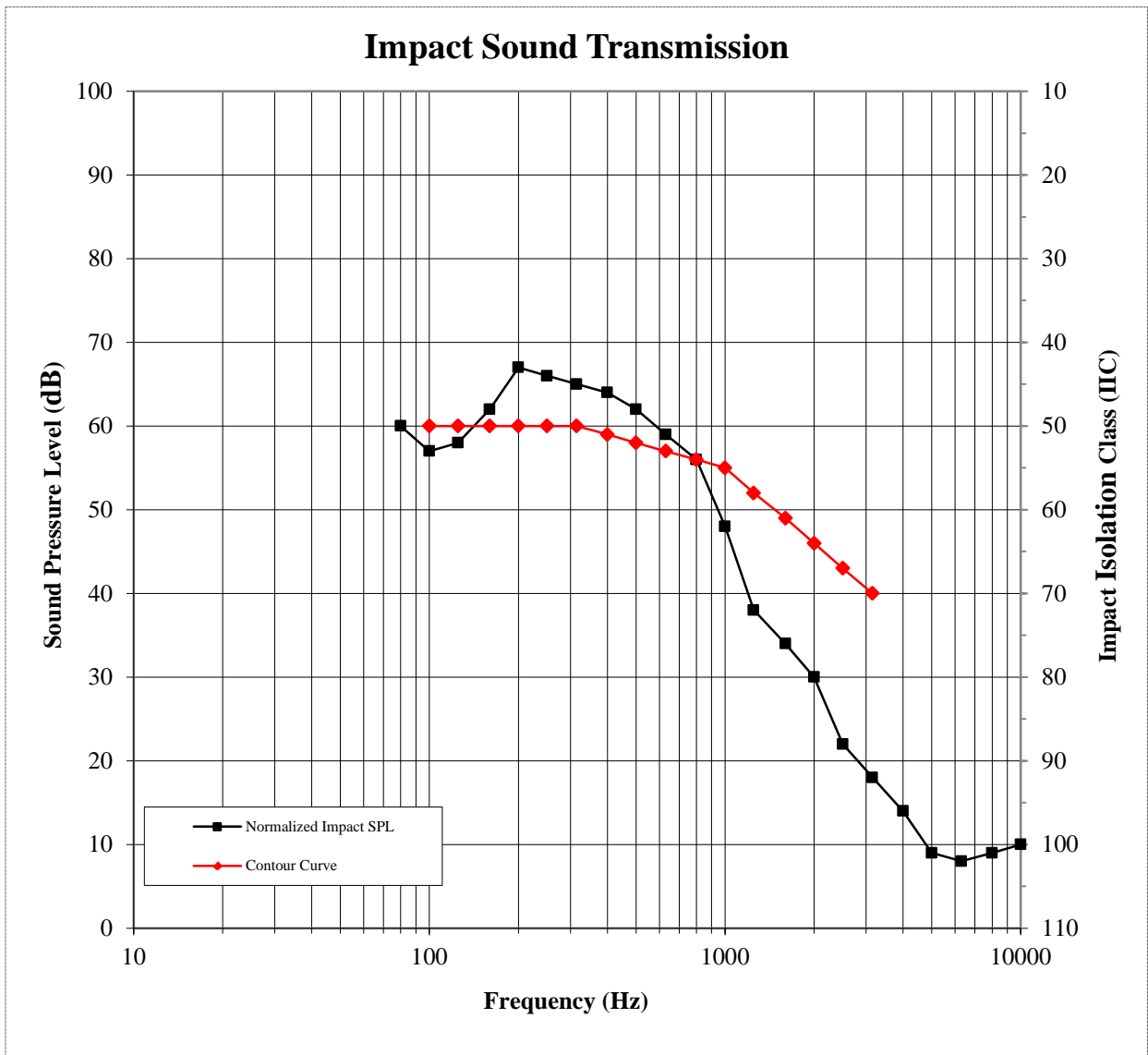


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IMPACT SOUND TRANSMISSION ASTM E 492

Test Date	06/17/14
Data File No.	D8974.04
Client	Regupol America
Description	2.4 mm Luxury Vinyl Plank, Regupol® Sonus™ LV270 2mm Underlayment, 152 mm Concrete Slab
Specimen Area	10.98 m ²
Technician	Daniel B. Mohler





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DELTA IMPACT INSULATION
ASTM E 2179

Test Date	06/17/14
Data File No.	D8974.04
Client	Regupol America
Description	2.4 mm Luxury Vinyl Plank, Regupol® Sonus™ LV270 2mm Underlayment, 152 mm Concrete Slab
Specimen Area	10.98 m ²
Technician	Daniel B. Mohler

Freq (Hz)	Bkgrd SPL (dB)	Absorption (Square Meters)	Normalized Impact SPL BARE (dB)	95% Conf Limit	Normalized Impact SPL SPEC (dB)	95% Conf Limit	Resulting Array L _{ref,c}	No. of Defici- encies
80	59.8	14.9	63.1	4.6	60.0	5.7	-	-
100	42.9	12.0	57.6	2.5	56.3	1.8	66	4
125	36.6	9.4	59.4	1.9	57.6	1.7	66	4
160	31.7	8.6	64.5	1.8	61.4	0.9	65	3
200	27.8	10.1	69.7	1.8	66.5	1.4	65	3
250	26.7	9.9	69.0	1.2	65.2	1.2	65	3
315	26.3	8.5	69.1	0.6	64.6	1.0	65	3
400	25.1	7.5	68.9	0.8	63.6	0.7	65	4
500	24.3	7.0	70.2	1.2	61.2	0.5	62	2
630	22.4	6.6	70.6	0.6	58.9	0.7	59	0
800	22.6	6.8	72.8	0.7	55.3	0.6	54	0
1000	22.5	6.7	73.6	0.9	48.0	0.4	46	0
1250	22.4	6.7	73.1	0.5	37.5	0.4	36	0
1600	18.7	6.7	74.3	0.7	33.6	0.5	31	0
2000	12.0	7.6	74.5	0.6	29.6	0.4	27	0
2500	8.0	8.3	74.8	1.1	22.0	0.5	19	0
3150	7.1	9.1	73.7	0.9	17.1	0.7	15	0
4000	7.2	10.5	72.7	1.0	13.4	0.5	-	-
5000	7.0	11.9	70.3	1.0	8.9	0.6	-	-
6300	6.9	14.9	66.2	1.2	8.0	0.7	-	-
8000	7.1	19.5	60.0	1.6	8.6	0.7	-	-
10000	7.2	24.9	52.4	2.0	9.5	0.8	-	-

ΔIIC Rating **22** *(Delta Impact Insulation Class)*

Deficiencies 26 *(Sum of Deficiencies)*

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

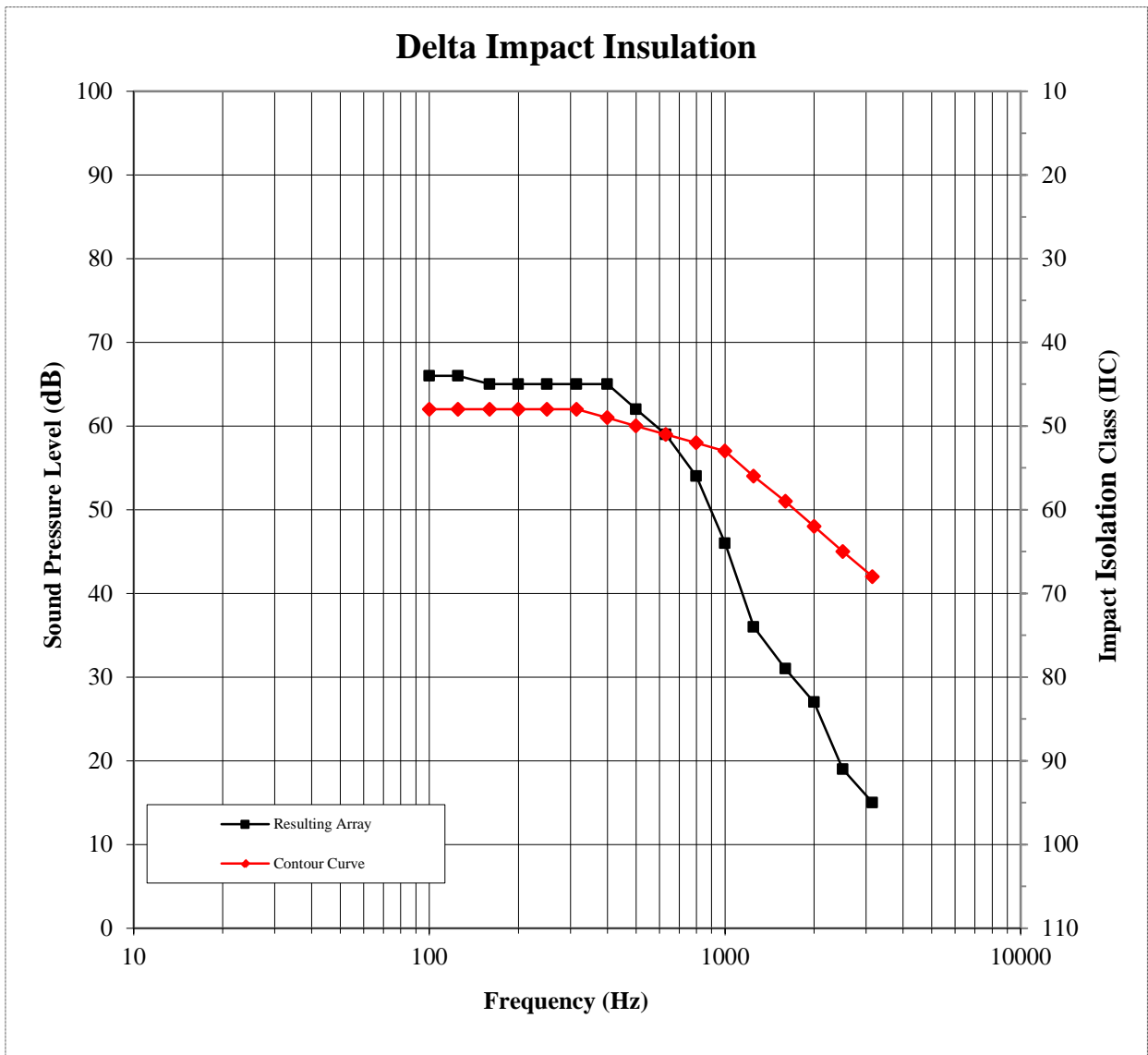


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DELTA IMPACT INSULATION ASTM E 2179

Test Date	06/17/14
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Description	2.4 mm Luxury Vinyl Plank, Regupol® Sonus™ LV270 2mm Underlayment, 152 mm Concrete Slab
Specimen Area	10.98 m ²
Technician	Daniel B. Mohler



Photographs

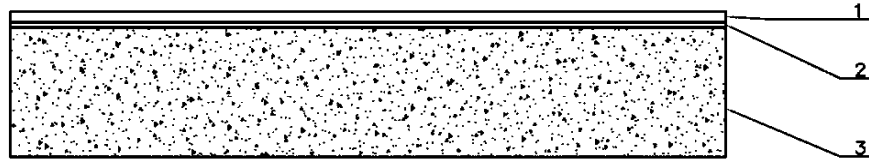


Source Room View of Test Specimen Installation



Receive Room View of Test Specimen Installation

Drawing



Cross Section View of Test Specimen

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