



**E1551.04-113-11-R0**  
**ACOUSTICAL PERFORMANCE TEST REPORT**  
**ASTM E 90, ASTM E 492, ASTM E 2179**

**Rendered to**

**REGUPOL AMERICA**

**Series/Model: 5 mm Regupol Sonus Rubber Underlayment**

**Specimen Type: Floor/Ceiling Assembly**

**Overall Size: 3023 mm by 3632 mm**

<b>STC</b>	<b>54</b>
<b>IIC</b>	<b>50</b>
<b>ΔIIC</b>	<b>20</b>

**Test Specimen Identification:**

Floor Topping: 7 mm Ceramic Tile

Underlayment: 5 mm Regupol Sonus Rubber Underlayment

Floor Slab: 152 mm Concrete Slab

Reference should be made to Architectural Testing, Inc. Report E1551.04-113-11 for complete test specimen description.



## Acoustical Performance Test Report

REGUPOL AMERICA  
33 Keystone Drive  
Lebanon, Pennsylvania 17042

<b>Report</b>	E1551.04-113-11
<b>Test Date</b>	10/01/14
<b>Report Date</b>	01/05/15
<b>Record Retention End Date</b>	10/01/18

### 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	20.7 °C	Maximum Temperature	20.9 °C
Minimum Temperature	20.4 °C	Minimum Temperature	20.8 °C
Average Temperature	20.6 °C	Average Temperature	20.9 °C
Maximum Relative Humidity	74%	Maximum Relative Humidity	72%
Minimum Relative Humidity	72%	Minimum Relative Humidity	72%
Average Relative Humidity	73%	Average Relative Humidity	72%

**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
Ceramic Tile	304.8 by 304.8	7.0	N/A	10.98 m <sup>2</sup>	14.09 kg/m <sup>2</sup>
	<i>Note: Grout was placed into the 6.35 mm joints between the ceramic tile and wiped clean. The ceramic tile was placed with light pressure onto a bed of mortar on the underlayment. The mortar was set using a 6.35 mm by 6.35 mm trowel. Both the grout and mortar were allowed to cure to manufacturer's specifications.</i>				

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

Material	Dimensions (mm)	Thickness (mm)	Manufacturer and Series	Quantity	Average Weight
Rubber Underlayment	3048 by 1219.2	5.0	Regupol Sonus	10.98 m <sup>2</sup>	3.49 kg/m <sup>2</sup>
	<i>Note: Loose laid.</i>				
Concrete Slab	3023 by 3632	152.0	N/A	10.98 m <sup>2</sup>	366.18 kg/m <sup>2</sup>
	<i>Note: The concrete slab was installed in a test frame flush to the source room.</i>				

**Comments**

The total weight of the floor/ceiling assembly was 4213.7 kg. Architectural Testing 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.

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:

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Leeland S. Hoover  
Technician II - Acoustical Testing

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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	01/05/15	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	09/14
Receive Room Environmental Indicator	Comet	T7510	63811	09/14
Source Room Environmental Indicator	Comet	T7510	63812	09/14
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 <sup>3</sup>
VT Source Room Volume	190 m <sup>3</sup>



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### AIRBORNE SOUND TRANSMISSION LOSS ASTM E 90

<b>Test Date</b>	10/01/14
<b>Data File No.</b>	E1551.04
<b>Client</b>	Regupol America
<b>Description</b>	7 mm Ceramic Tile, 5 mm Regupol Sonus Rubber Underlayment, 152 mm Concrete Slab
<b>Specimen Area</b>	10.98 m <sup>2</sup>
<b>Technician</b>	Leeland S. Hoover

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	65.9	14.2	104	65	40	4.80	-
100	42.9	11.9	101	61	41	2.90	-
125	37.7	9.2	108	68	41	2.00	0
160	36.1	8.6	99	63	37	1.80	4
200	30.5	11.2	97	62	36	1.80	8
250	30.3	10.6	98	59	40	1.00	7
315	28.1	9.1	98	56	43	1.60	7
400	26.7	7.6	96	51	47	1.00	6
500	24.7	6.9	97	45	55	0.80	0
630	24.7	6.6	99	43	60	0.70	0
800	25.3	6.7	99	40	62	0.70	0
1000	24.8	6.7	98	39	63	0.90	0
1250	24.7	6.9	99	38	63	0.70	0
1600	21.7	6.8	98	36	65	0.70	0
2000	15.4	7.5	99	34	67	0.60	0
2500	12.7	8.3	99	34	67	0.60	0
3150	11.5	9.1	99	31	70	0.90	0
4000	10.8	10.2	99	30	70	0.70	0
5000	10.3	11.7	99	25	75	0.70	-
6300	10.0	14.4	94	14	80	1.20	-
8000	10.2	19.1	93	10	82	1.50	-
10000	10.4	23.9	88	7	79	2.10	-

**STC Rating**      **54**      (*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

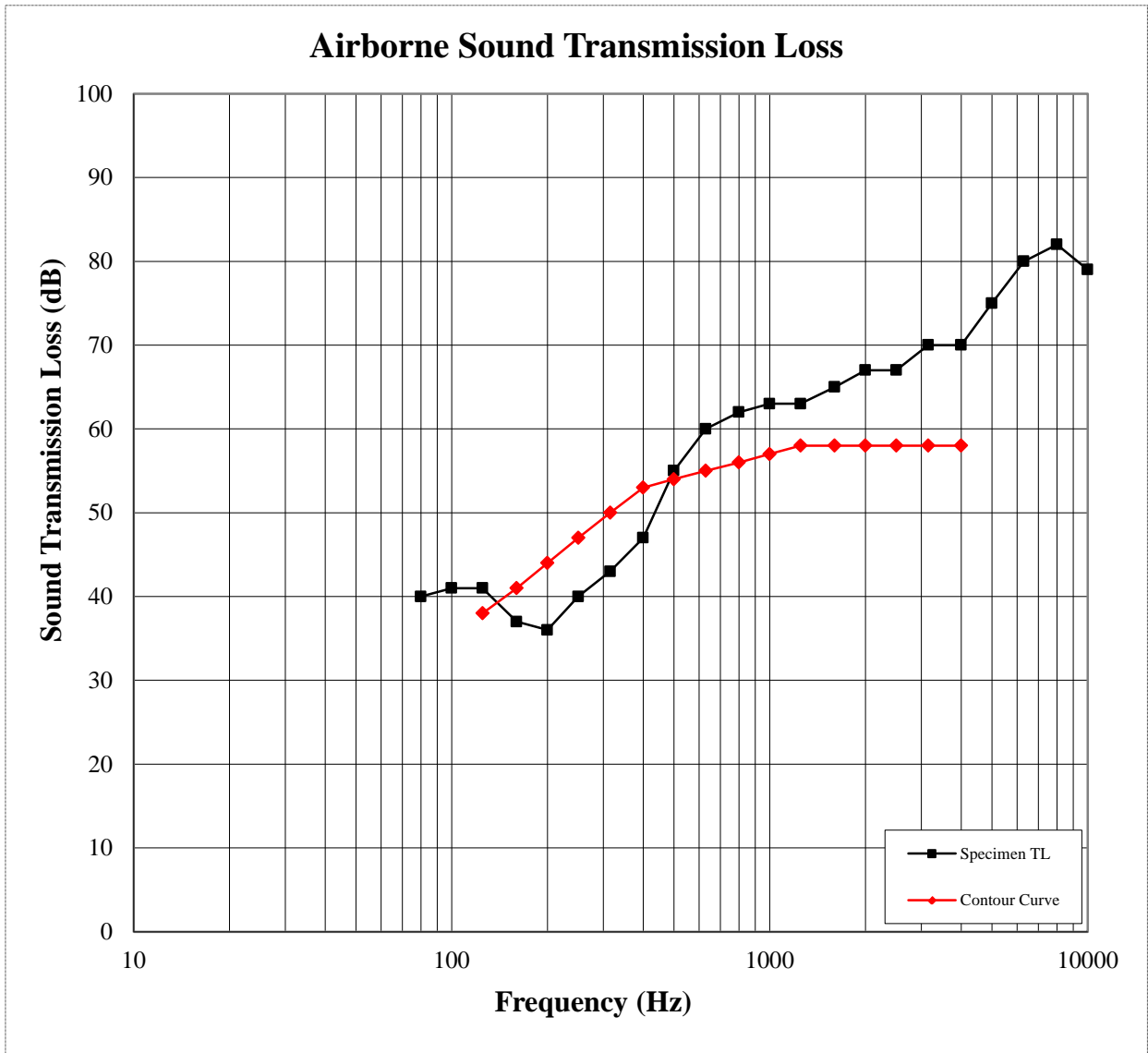


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### AIRBORNE SOUND TRANSMISSION LOSS ASTM E 90

<b>Test Date</b>	10/01/14
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<b>Client</b>	Regupol America
<b>Description</b>	7 mm Ceramic Tile, 5 mm Regupol Sonus Rubber Underlayment, 152 mm Concrete Slab
<b>Specimen Area</b>	10.98 m <sup>2</sup>
<b>Technician</b>	Leeland S. Hoover







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### IMPACT SOUND TRANSMISSION ASTM E 492

<b>Test Date</b>	10/01/14
<b>Data File No.</b>	E1551.04
<b>Client</b>	Regupol America
<b>Description</b>	7 mm Ceramic Tile, 5 mm Regupol Sonus Rubber Underlayment, 152 mm Concrete Slab
<b>Specimen Area</b>	10.98 m <sup>2</sup>
<b>Technician</b>	Leeland S. Hoover

Freq (Hz)	Background SPL (dB)	Absorption (m <sup>2</sup> )	Normalized Impact SPL (dB)	95% Confidence Limit	Number of Deficiencies
80	65.3	14.2	54	4.0	-
100	44.1	12.6	57	3.4	0
125	38.1	10.1	58	1.1	0
160	36.3	9.0	63	2.8	1
200	30.8	10.1	69	1.4	7
250	30.4	11.3	68	3.0	6
315	27.8	9.6	68	1.1	6
400	26.8	8.1	66	2.1	5
500	26.2	7.3	62	1.8	2
630	24.6	7.2	62	2.2	3
800	25.0	7.5	60	1.4	2
1000	25.1	7.3	57	2.8	0
1250	24.6	7.5	54	2.6	0
1600	21.8	7.3	49	1.7	0
2000	15.9	8.0	45	1.7	0
2500	13.5	8.9	42	1.2	0
3150	12.7	9.7	36	0.9	0
4000	11.8	11.0	31	2.6	-
5000	11.5	12.5	21	4.1	-
6300	11.2	15.4	15	3.4	-
8000	11.1	20.5	14	3.4	-
10000	10.9	25.7	14	3.6	-

**IIC Rating**      **50**      *(Impact Insulation Class)*  
**Deficiencies**    **32**      *(Sum of Deficiencies)*

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

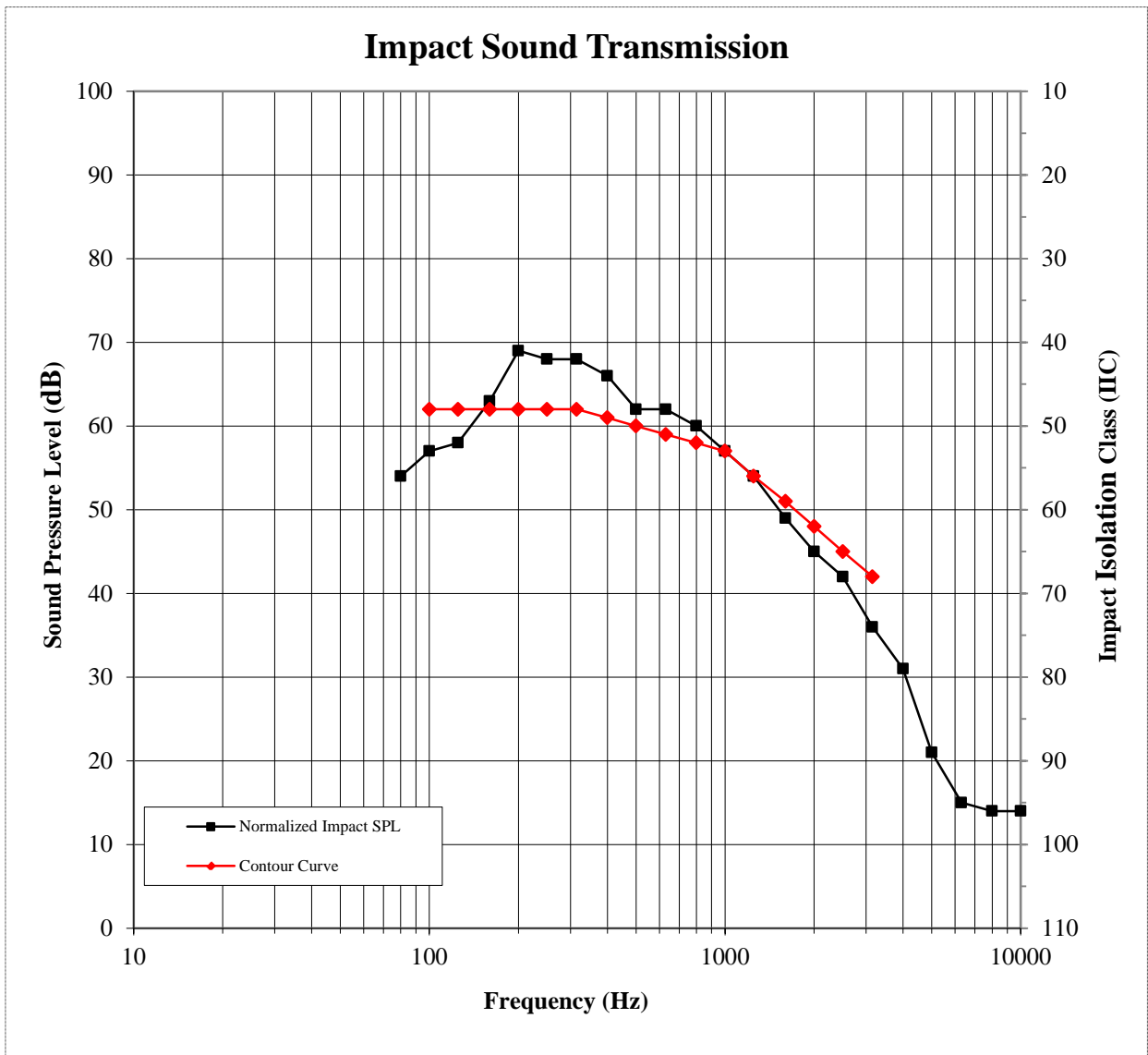


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### IMPACT SOUND TRANSMISSION ASTM E 492

<b>Test Date</b>	10/01/14
<b>Data File No.</b>	E1551.04
<b>Client</b>	Regupol America
<b>Description</b>	7 mm Ceramic Tile, 5 mm Regupol Sonus Rubber Underlayment, 152 mm Concrete Slab
<b>Specimen Area</b>	10.98 m <sup>2</sup>
<b>Technician</b>	Leeland S. Hoover





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**DELTA IMPACT INSULATION**  
ASTM E 2179

<b>Test Date</b>	10/01/14
<b>Data File No.</b>	E1551.04
<b>Client</b>	Regupol America
<b>Description</b>	7 mm Ceramic Tile, 5 mm Regupol Sonus Rubber Underlayment, 152 mm Concrete Slab
<b>Specimen Area</b>	10.98 m <sup>2</sup>
<b>Technician</b>	Leeland S. Hoover

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 <sub>ref,c</sub>	No. of Defici- encies
80	65.3	12.8	66.2	4.7	53.7	5.6	-	-
100	44.1	11.4	57.8	1.7	56.4	1.7	66	2
125	38.1	9.2	60.2	2.1	57.3	1.7	65	1
160	36.3	8.1	63.4	1.7	62.2	1.4	67	3
200	30.8	9.2	69.6	2.0	68.8	1.3	68	4
250	30.4	10.2	68.2	1.0	67.8	1.1	69	5
315	27.8	8.7	66.1	0.6	67.9	0.8	71	7
400	26.8	7.4	67.4	0.6	65.8	0.7	68	5
500	26.2	6.6	67.4	0.5	61.2	0.7	64	2
630	24.6	6.5	68.9	0.9	61.3	0.4	63	2
800	25.0	6.8	71.3	0.7	59.9	0.4	60	0
1000	25.1	6.6	72.0	0.5	56.3	0.4	56	0
1250	24.6	6.8	72.4	0.3	53.2	0.3	53	0
1600	21.8	6.6	72.9	0.3	48.8	0.3	48	0
2000	15.9	7.3	73.6	0.6	44.8	0.2	43	0
2500	13.5	8.0	73.7	0.9	41.9	0.4	40	0
3150	12.7	8.8	72.7	0.9	36.0	0.6	35	0
4000	11.8	9.9	71.2	1.1	30.8	0.7	-	-
5000	11.5	11.3	68.7	1.7	20.4	0.6	-	-
6300	11.2	13.9	64.4	2.4	14.1	0.7	-	-
8000	11.1	18.5	57.2	3.0	13.3	0.6	-	-
10000	10.9	23.3	49.8	3.9	13.7	0.6	-	-

**ΔIIC Rating**      **20**      *(Delta Impact Insulation Class)*  
**Deficiencies**      **31**      *(Sum of Deficiencies)*

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

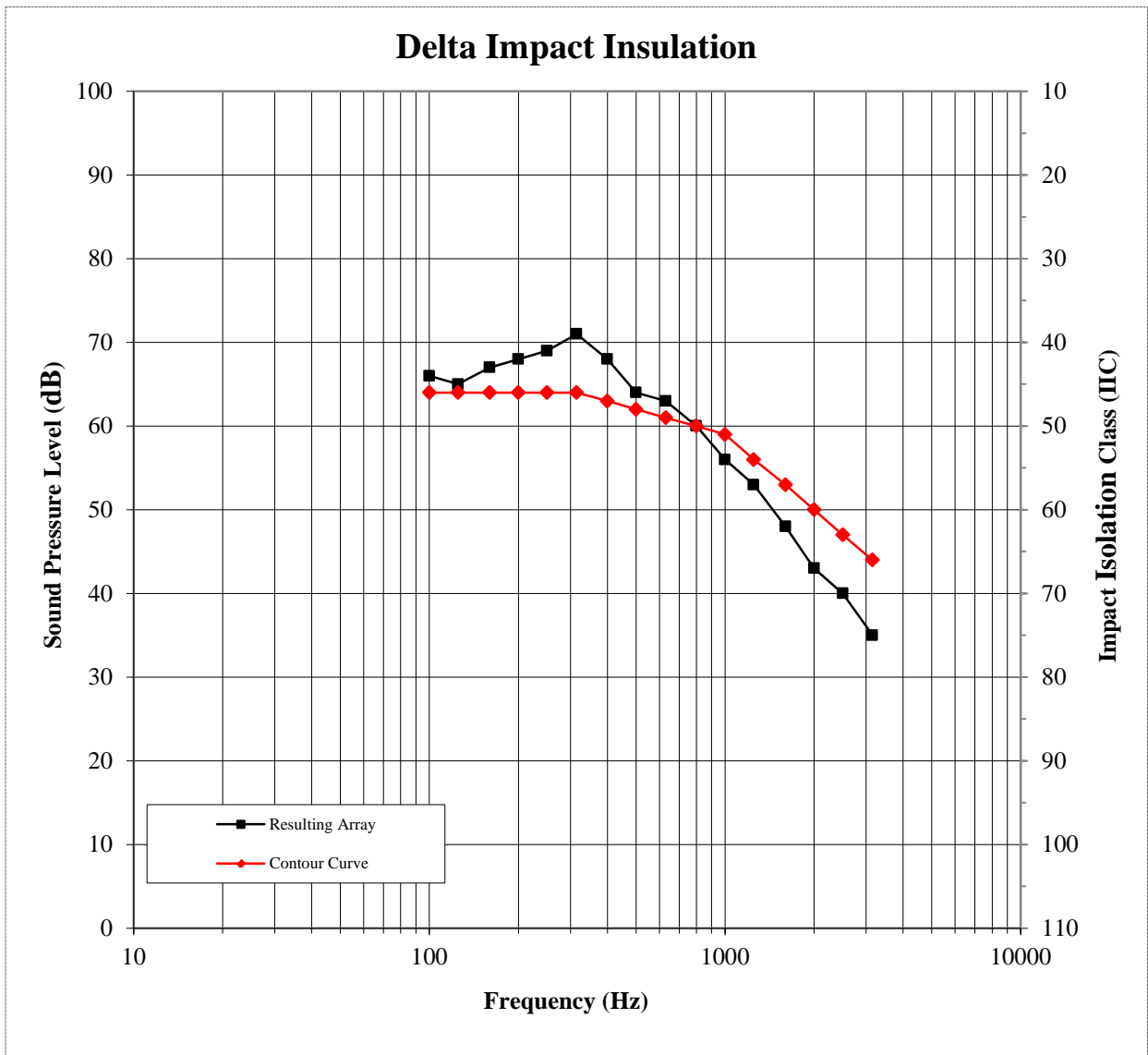


E1551.04-113-11-R0



### DELTA IMPACT INSULATION ASTM E 2179

<b>Test Date</b>	10/01/14
<b>Data File No.</b>	E1551.04
<b>Client</b>	Regupol America
<b>Description</b>	7 mm Ceramic Tile, 5 mm Regupol Sonus Rubber Underlayment, 152 mm Concrete Slab
<b>Specimen Area</b>	10.98 m <sup>2</sup>
<b>Technician</b>	Leeland S. Hoover



**Photographs**

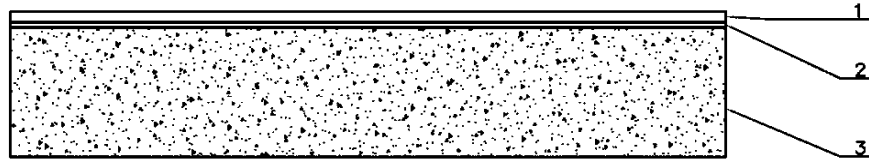


**Source Room View of Test Specimen Installation**



**Receive Room View of Test Specimen Installation**

**Drawing**



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