



F7833.03-113-11-R0
ACOUSTICAL PERFORMANCE TEST REPORT
ASTM E 90, ASTM E 492, ASTM E 2179

Rendered to

EXPANKO, DIVISION OF THE STONCOR GROUP INCORPORATED

Series/Model: Expanko CorkCore LVT

Specimen Type: 152 mm Concrete Slab with Drop Ceiling*

Overall Size: 3023 mm by 3632 mm

STC	62
IIC	61
ΔIIC	18

Test Specimen Identification:

Floor Topping: 6 mm Expanko CorkCore Luxury Vinyl Tile

Floor Slab: 152 mm Concrete Slab

Main Beams: 0.5 mm Armstrong HD8906 Drywall Main Beam*

Cross Tees: 0.5 mm Armstrong XL8945P Cross Tee*

Insulation: 88.9 mm Johns Manville Kraft Faced R-13 Fiberglass Insulation*

Ceiling: 15.9 mm National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel*

*Drop ceiling materials removed to conduct Δ IIC test per ASTM E 2179

Reference should be made to Intertek-ATI Report F7833.03-113-11 for complete test specimen description. This page alone is not a complete report.



Acoustical Performance Test Report

EXPANKO, DIVISION OF THE STONCOR GROUP INCORPORATED

180 Gordon Drive, Suite 113

Exton, Pennsylvania 19341

Report	F7833.03-113-11
Test Date	05/27/15
Report Date	07/28/16

Project Scope

This report is a reissue of the original Report No. E7833.01-113-11 and is rendered to Expanko, division of the StonCor Group Incorporated through written authorization. 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 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 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 drop ceiling was removed from the assembly, and the delta impact insulation test was conducted in accordance with ASTM E 2179 test method. Two sound pressure level measurements with the tapping machine operating at each position specified by ASTM E 492 with and without the floor topping installed.

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

Test Conditions

Source Room		Receive Room	
Average Temperature	21.6°C	Average Temperature	21.3°C
Average Relative Humidity	54%	Average Relative Humidity	55%

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, and ASTM E 2179, respectively.

Test Specimen Materials and Installation Details

Material	Dimensions (mm)	Thickness (mm)	Manufacturer and Series	Quantity	Average Weight
Luxury Vinyl Tile	145 by 1225	6.0	Expanko CorkCore	10.98 m ²	8.4 kg/m ²
	<i>Note: Loose laid</i>				
Concrete Slab	3023 by 3632	152.0	N/A	10.98 m ²	429.65 kg/m ²
	<i>Note: The concrete slab was installed in a test frame flush to the source room.</i>				

Test Specimen Materials and Installation Details (Continued)

Material	Dimensions (mm)	Thickness (mm)	Manufacturer and Series	Quantity	Average Weight
Drywall Main Beam*	38.1 by 43 by 2870	0.5	Armstrong HD8906	10.9 lin m	0.45 kg/m
	<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.</i>				
Cross Tee*	38.3 by 37.3 by 1219	0.5	Armstrong XL8945P	27.2 lin m	0.45 kg/m
	<i>Note: Inserted into the main beams on 607 mm centers</i>				
Fiberglass Insulation*	2962 by 584	88.9	Johns Manville Kraft Faced R-13	10.98 m ²	1.33 kg/m ²
	<i>Note: Loose laid onto the ceiling grid system</i>				
Gypsum Panel*	3023 by 1219	15.9	National Gypsum Gold Bond® Fire-Shield® Type X	10.56 m ²	11.23 kg/m ²
	<i>Note: Fastened with fine thread drywall screws on 305 mm centers</i>				

*Drop ceiling materials were not present for the ΔIIC test per ASTM E 2179

Comments

The total weight of the floor/ceiling assembly was 4960.1 kg. Intertek-ATI will store samples of the test specimen for four years. Photographs of the test specimen are included in the attachments. Drawings of the test specimen are included in the attachments.



This report is reissued in the name of Expanko, division of the StonCor Group Incorporated through written authorization from the original report holder.

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

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FOR INTERTEK-ATI:

Daniel B. Mohler
Technician II - Acoustical Testing

Jordan Strybos
Project Manager - Acoustical Testing

Attachments (9 Pages): This report is complete only when all attachments are included.

** Stated by Client/Manufacturer*

N/A - Non Applicable

Revision Log

<u>Revision</u>	<u>Date</u>	<u>Page(s)</u>	<u>Description</u>
R0	07/28/16	N/A	Original Report Issue - Reissue of Report No. E7833.01-113-11 in the name of Expanko, division of the StonCor Group Incorporated

Attachments

Instrumentation

Instrument	Manufacturer	Model	ATI Number	Date of Calibration
Data Acquisition Unit	National Instruments	PXI-1033	63763	06/14 *
Microphone Calibrator	Norsonic	1251	Y002919	06/14
Receive Room Microphone	PCB Piezotronics	378B20	63748	05/15
Receive Room Microphone	PCB Piezotronics	378B20	63744	05/15
Receive Room Microphone	PCB Piezotronics	378B20	63745	05/15
Receive Room Microphone	PCB Piezotronics	378B20	63746	05/15
Receive Room Microphone	PCB Piezotronics	378B20	63747	05/15
Receive Room Environmental Indicator	Comet	T7510	63810 63811	09/14 09/14
Source Room Microphone	PCB Piezotronics	378B20	63738	04/15
Source Room Microphone	PCB Piezotronics	378B20	63739	04/15
Source Room Microphone	PCB Piezotronics	378B20	63740	04/15
Source Room Microphone	PCB Piezotronics	378B20	63742	04/15
Source Room Microphone	PCB Piezotronics	378B20	63741	04/15
Source Room Environmental Indicator	Comet	T7510	63812	09/14
Tapping Machine	Look Line s.r.l.	EM50 (TM50)	65351	11/14

* 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
VT Source Room Volume	190 m ³



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AIRBORNE SOUND TRANSMISSION LOSS
ASTM E 90

Test Date	05/27/15
Data File No.	E7833.01
Client	Expanko, division of the StonCor Group Incorporated
Description	6 mm Expanko CorkCore Luxury Vinyl Tile, 152 mm Concrete Slab, 0.5 mm Armstrong HD8906 Drywall Main Beam, 0.5 mm Armstrong XL8945P Cross Tee, 88.9 mm Johns Manville Kraft Faced R-13 Fiberglass Insulation, 15.9 mm National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel
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	67.0	10.9	106	68	39	3.20	-
100	42.1	11.0	107	69	39	1.60	-
125	37.5	9.9	109	69	42	1.20	4
160	32.6	8.6	110	70	43	1.70	6
200	29.2	9.5	107	61	48	1.60	4
250	27.4	9.4	105	56	51	1.40	4
315	28.3	9.8	106	52	55	0.90	3
400	28.0	8.2	104	49	58	0.80	3
500	24.8	7.8	103	45	61	0.70	1
630	22.6	7.4	105	46	62	1.00	1
800	23.5	7.3	104	46	61	0.60	3
1000	23.7	7.3	103	42	65	0.50	0
1250	23.6	7.5	105	41	66	1.10	0
1600	20.1	7.9	104	41	66	0.50	0
2000	14.3	8.7	104	41	66	0.70	0
2500	12.4	9.7	104	39	67	0.60	0
3150	10.7	10.3	103	35	69	0.70	0
4000	8.4	11.7	103	32	71	0.70	0
5000	7.5	13.4	103	28	74	0.90	-
6300	7.0	17.1	97	20	77	0.90	-
8000	6.7	22.5	97	17	77	1.00	-
10000	6.5	27.9	92	11	78	0.90	-

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

Deficiencies 29 (*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

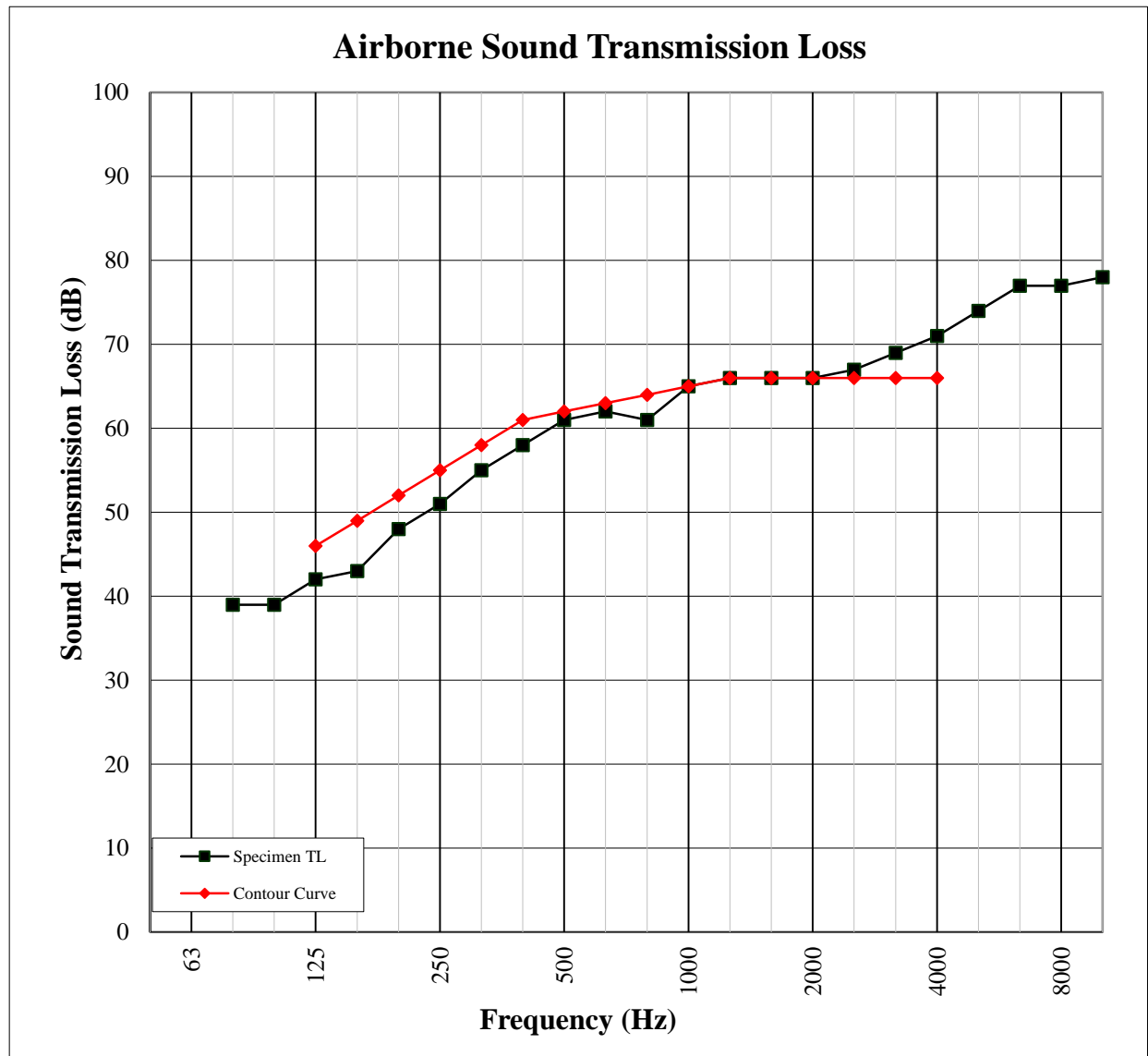


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AIRBORNE SOUND TRANSMISSION LOSS ASTM E 90

Test Date	05/27/15
Data File No.	E7833.01
Client	Expanko, division of the StonCor Group Incorporated
Description	6 mm Expanko CorkCore Luxury Vinyl Tile, 152 mm Concrete Slab, 0.5 mm Armstrong HD8906 Drywall Main Beam, 0.5 mm Armstrong XL8945P Cross Tee, 88.9 mm Johns Manville Kraft Faced R-13 Fiberglass Insulation, 15.9 mm National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel
Specimen Area	10.98 m ²
Technician	Daniel B. Mohler





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IMPACT SOUND TRANSMISSION
ASTM E 492

Test Date	05/27/15
Data File No.	E7833.01
Client	Expanko, division of the StonCor Group Incorporated
Description	6 mm Expanko CorkCore Luxury Vinyl Tile, 152 mm Concrete Slab, 0.5 mm Armstrong HD8906 Drywall Main Beam, 0.5 mm Armstrong XL8945P Cross Tee, 88.9 mm Johns Manville Kraft Faced R-13 Fiberglass Insulation, 15.9 mm National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel
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	67.2	16.6	66	5.2	-
100	40.9	12.1	53	1.6	2
125	36.4	10.2	50	2.5	0
160	31.4	8.9	51	1.6	0
200	28.3	10.0	51	1.5	0
250	27.0	9.4	51	1.2	0
315	27.8	9.8	50	0.9	0
400	27.7	8.4	50	1.0	0
500	24.0	7.6	49	0.9	0
630	22.5	7.2	49	1.2	1
800	23.7	7.4	52	0.6	5
1000	24.0	7.4	49	0.7	3
1250	23.5	7.5	48	0.5	5
1600	19.3	7.9	46	0.3	6
2000	12.9	8.6	41	0.2	4
2500	9.6	9.6	36	0.2	2
3150	9.0	10.3	33	0.6	2
4000	6.8	11.9	27	0.9	-
5000	5.9	13.5	9	0.5	-
6300	6.1	17.2	8	0.5	-
8000	6.4	22.4	9	0.6	-
10000	6.4	28.2	9	0.7	-

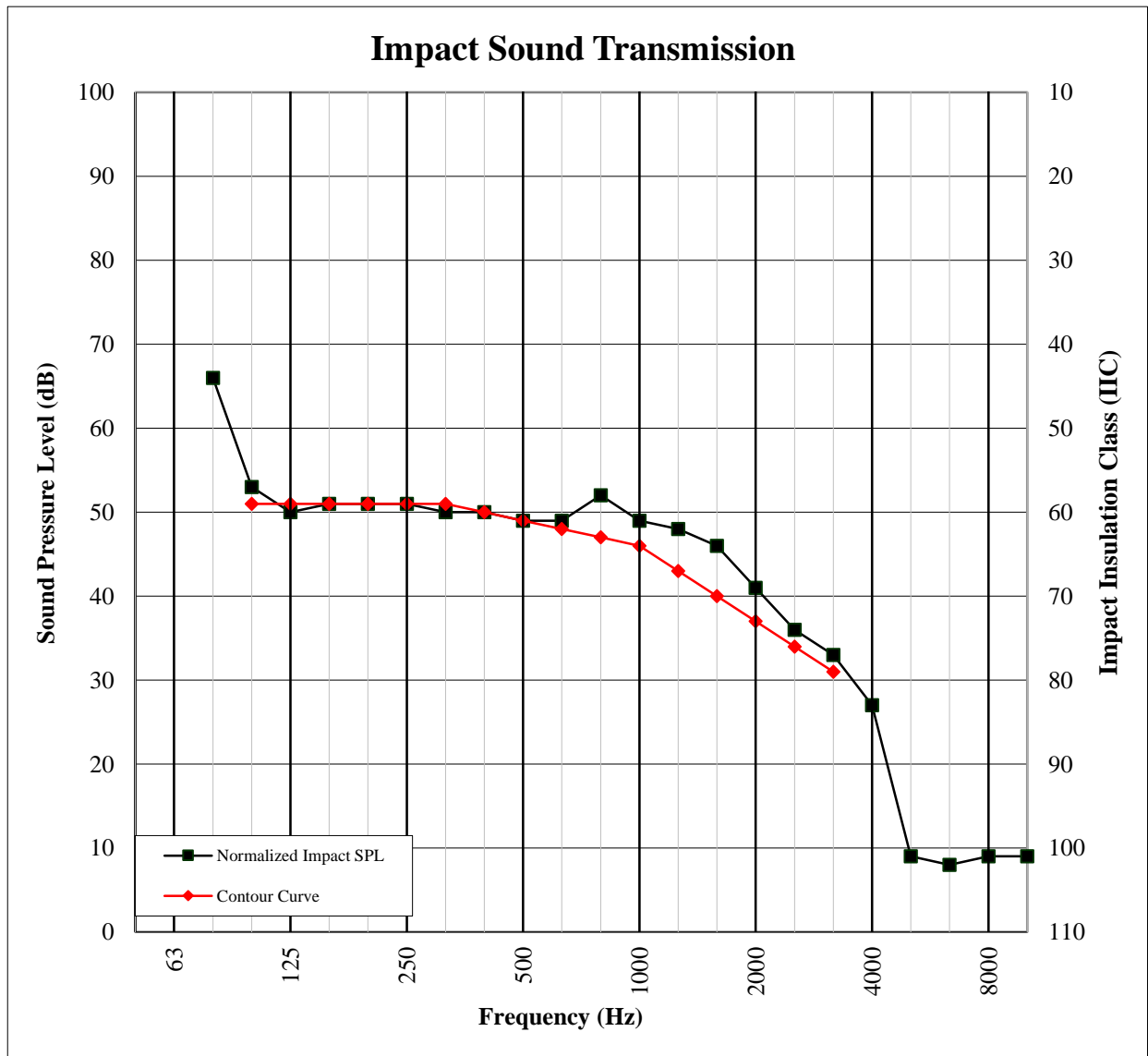
IIC Rating **61** *(Impact Insulation Class)*

Deficiencies **30** *(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	05/27/15
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Client	Expanko, division of the StonCor Group Incorporated
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Specimen Area	10.98 m ²
Technician	Daniel B. Mohler





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DELTA IMPACT INSULATION
ASTM E 2179

Test Date	05/27/15
Data File No.	E7833.01
Client	Expanko, division of the StonCor Group Incorporated
Description	6 mm Expanko CorkCore Luxury Vinyl Tile, 152 mm Concrete Slab
Specimen Area	10.98 m ²
Technician	Daniel B. Mohler

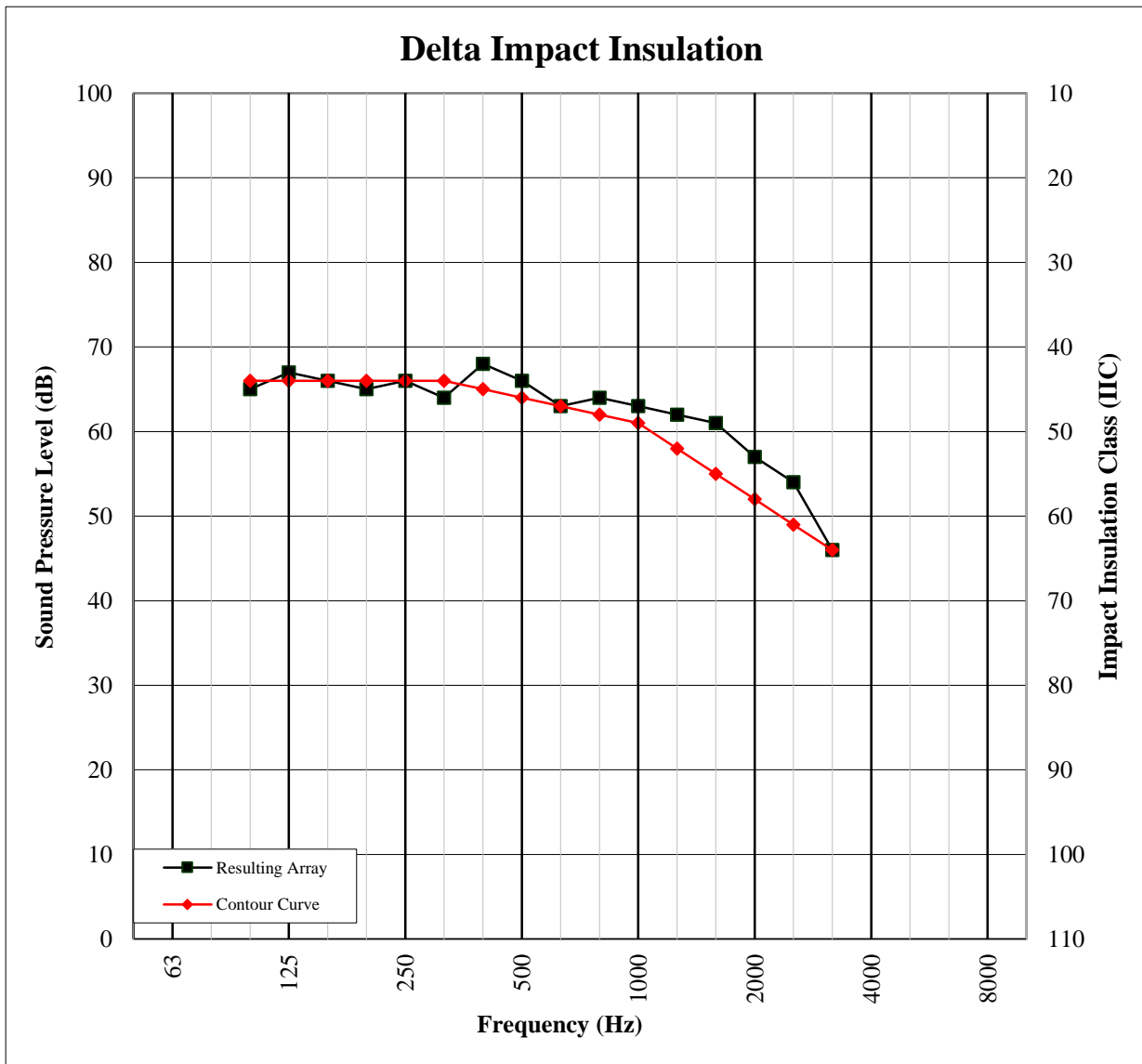
Freq (Hz)	Bkgrd SPL (dB)	Absorption (Square Meters)	Normalized Impact SPL BARE (dB)	95% Conf Limit	Normalized Impact SPL SPEC (dB)	95% Conf Limit	Resulting Array L _{ref,c}	No. of Defici- encies
100	40.2	19.9	58.4	1.0	56.9	1.6	65	0
125	31.5	12.9	58.7	3.5	58.4	0.6	67	1
160	25.1	15.6	64.8	4.8	63.0	1.6	66	0
200	20.2	15.4	69.9	1.9	66.3	2.6	65	0
250	23.2	16.7	69.1	0.4	66.2	1.7	66	0
315	19.5	14.8	70.4	1.2	65.0	0.7	64	0
400	18.1	12.9	69.3	3.8	67.6	0.6	68	3
500	20.4	12.6	69.5	0.6	64.8	0.8	66	2
630	17.1	11.4	70.7	2.3	62.6	1.3	63	0
800	17.8	12.1	72.2	2.3	64.8	1.4	64	2
1000	19.4	11.7	73.0	2.1	63.8	0.7	63	2
1250	19.6	11.2	73.1	1.5	62.9	1.6	62	4
1600	16.8	10.9	73.7	1.8	62.7	1.2	61	6
2000	10.0	11.7	74.2	2.1	59.6	0.6	57	5
2500	7.0	11.9	73.9	1.7	55.6	1.0	54	5
3150	6.0	12.6	73.2	2.4	47.7	0.4	46	0

ΔIIC Rating **18** *(Delta Impact Insulation Class)*
Deficiencies **30** *(Sum of Deficiencies)*

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

DELTA IMPACT INSULATION
ASTM E 2179

Test Date	05/27/15
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Client	Expanko, division of the StonCor Group Incorporated
Description	6 mm Expanko CorkCore Luxury Vinyl Tile, 152 mm Concrete Slab
Specimen Area	10.98 m ²
Technician	Daniel B. Mohler



Photographs

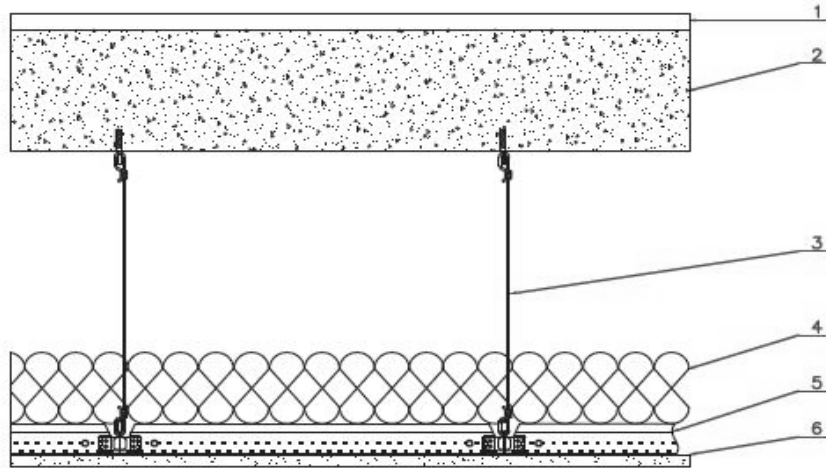


Source Room View of Test Specimen Installation



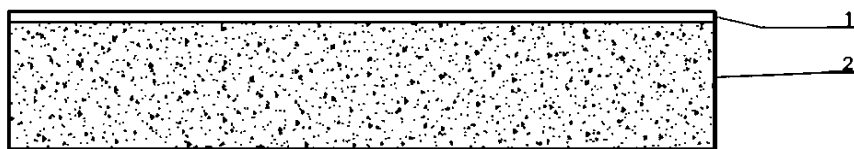
Receive Room View of Test Specimen Installation

Drawings



ASTM E 90 and ASTM E 492 Tests:

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



ASTM E 2179 Test:

- 1-Floor Topping
- 2-Concrete Slab