

D6771.04-113-11-R0
ACOUSTICAL PERFORMANCE TEST REPORT
ASTM E 90 AND ASTM E 492

Rendered to

ECORE INTERNATIONAL

Series/Model: ECORE International QT4012 Rubber Underlayment

Specimen Type: Floor/Ceiling Assembly

Overall Size: 3023 mm by 3632 mm

STC	57
IIC	53

Test Sample Identification:

Floor Topping: 7.2 mm Porcelain Tile

Floor Underlayment: 12 mm ECORE International QT4012 Rubber Underlayment

Floor Slab: 203 mm Concrete Slab

Reference should be made to Architectural Testing, Inc. Report D6771.04-113-11 for complete test specimen description.

Acoustical Performance Test Report

ECORE INTERNATIONAL
715 Fountain Avenue
Lancaster, Pennsylvania 17601

Report	D6771.04-113-11
Test Date	04/25/14
Report Date	05/16/14
Record Retention End Date	04/25/18

Project Scope

ECORE International contracted Architectural Testing to conduct airborne sound transmission loss and impact sound transmission 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 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 sound transmission loss test was conducted in accordance with the ASTM E 90 test method using a single direction of measurement. Two background noise sound pressure level and twenty-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 twenty-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	
Maximum Temperature	20.6 °C	Maximum Temperature	19.5 °C
Minimum Temperature	20.5 °C	Minimum Temperature	19.2 °C
Average Temperature	20.5 °C	Average Temperature	19.3 °C
Maximum Relative Humidity	40%	Maximum Relative Humidity	42%
Minimum Relative Humidity	39%	Minimum Relative Humidity	40%
Average Relative Humidity	39%	Average Relative Humidity	41%

Test Calculations

The STC (Sound Transmission Class) rating was calculated in accordance with ASTM E 413. The IIC (Impact Insulation Class) rating was calculated in accordance with ASTM E 989.

Test Specimen Construction

The test specimen was constructed in the 3023 mm long by 3632 mm wide by 457 mm high opening.

The porcelain tiles were set into the bed of mortar and separated by 6.35 mm spacers. Latex modified mortar was mixed as per manufacturer's specifications and troweled on top of the underlayment using a 9.53 mm by 9.53 mm square notch trowel. The mortar was allowed to cure according to the manufacturer's specifications. Sanded grout was mixed as per manufacturer's specifications and troweled into the 6.35 mm spaces between the ceramic tiles using a grout float. All excess grout was cleaned using a damp sponge. The grout was allowed to cure according to the manufacturer's specifications before testing. The perimeter of the porcelain tile floor was sealed to the test frame with duct seal.

A single layer of 12 mm E CORE International QT4012 was placed on top of the EGRIP EVOLVE flooring adhesive within 30 minutes of application. The EGRIP EVOLVE flooring adhesive was troweled over a protective layer using a 1.5 mm by 1.5 mm square notch trowel. A single layer of 0.05 mm polyethylene sheet was adhered to the concrete slab as a protective layer.

Test Specimen Construction (Continued)

The concrete slab was installed into a test frame flush to the source room. The concrete slab was isolated from the test frame. The perimeter of the concrete slab was sealed with duct seal. Cure time for the concrete slab exceeded 28 days.

Test Specimen Materials

Material	Dimensions (mm)	Thickness (mm)	Manufacturer and Series	Quantity	Average Weight	Total Weight
Porcelain Tile	304.8 by 304.8	7.20	N/A	10.98 m ²	15 kg/m ²	164.6 kg
Rubber Underlayment	3023 by 1219	12.00	ECORE International QT4012	10.98 m ²	8.8 kg/m ²	96.6 kg
Concrete Slab	3023 by 3632	203.00	N/A	10.98 m ²	488.2 kg/m ²	5360.4 kg

Comments

The total weight of the floor/ceiling assembly was 5621.6 kg. Architectural Testing will store samples of the test specimen for four years. Photographs of the test specimen are included in the attachments. Installation drawings are 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:



Digitally Signed by: Daniel Mohler

Daniel B. Mohler
Technician II - Acoustical Testing



Digitally Signed by: Bradley Hunt

Bradlay D. Hunt
Project Manager - Acoustical Testing

Attachments (7)

* Stated by Client/Manufacturer

N/A - Non Applicable

Revision Log

<u>Revision</u>	<u>Date</u>	<u>Page(s)</u>	<u>Description</u>
R0	05/16/14	N/A	Original Report Issue

Attachments

Instrumentation

Instrument	Manufacturer	Model	ATI Number	Date of Calibration
Data Acquisition Unit	National Instruments	PXI-1033	63763	06/12 *
Source Room Microphone	PCB Piezotronics	378B20	64902	11/13
Source Room Microphone	PCB Piezotronics	378B20	64903	11/13
Source Room Microphone	PCB Piezotronics	378B20	64904	11/13
Source Room Microphone	PCB Piezotronics	378B20	64905	11/13
Source Room Microphone	PCB Piezotronics	378B20	64906	11/13
Receive Room Microphone	PBC Piezotronics	378B20	64907	11/13
Receive Room Microphone	PCB Piezotronics	378B20	64908	11/13
Receive Room Microphone	PCB Piezotronics	378B20	64909	11/13
Receive Room Microphone	PCB Piezotronics	378B20	64910	11/13
Receive Room Microphone	PCB Piezotronics	378B20	64911	11/13
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	C002919	07/13
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	158.3 m ³
VT Source Room Volume	190 m ³

SOUND TRANSMISSION LOSS
ASTM E 90



Test Date	04/25/14
Data File No.	D6771.04
Client	ECORE International
Description	7.2 mm Porcelain Tile, 12 mm Ecore International QT4012 Rubber Underlayment, 203 mm Concrete Slab
Specimen Area	10.98 m ²
Technician	Daniel B. Mohler

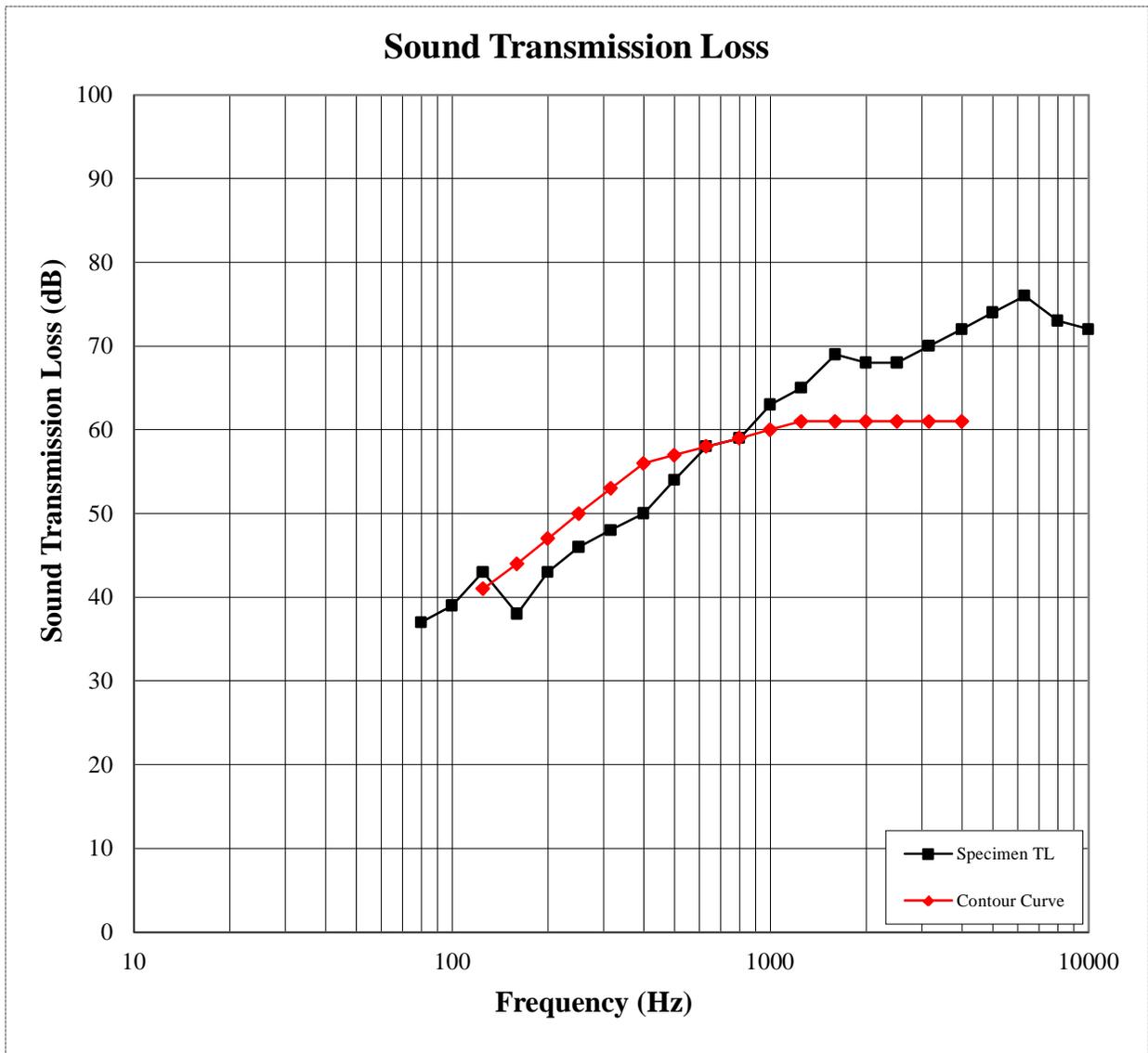
Freq (Hz)	Background SPL (dB)	Absorption (m ²)	Source SPL (dB)	Receive SPL (dB)	Specimen TL (dB)	95% Confidence Limit	Number of Deficiencies
80	47.8	16.5	98	60	37	6.23	-
100	41.1	11.2	94	56	39	4.34	-
125	36.5	8.8	99	57	43	3.09	0
160	27.7	9.3	94	57	38	2.48	6
200	25.2	11.0	94	52	43	3.27	4
250	26.8	9.8	94	49	46	1.29	4
315	21.8	9.7	96	50	48	1.81	5
400	20.0	8.2	94	46	50	1.00	6
500	23.8	6.9	94	42	54	0.77	3
630	23.0	6.9	95	41	58	1.42	0
800	22.6	6.9	95	39	59	1.24	0
1000	22.5	6.9	96	36	63	0.89	0
1250	22.2	7.0	96	34	65	0.79	0
1600	22.8	7.1	94	29	69	0.90	0
2000	11.7	8.2	95	30	68	0.55	0
2500	10.0	9.4	94	27	68	0.64	0
3150	10.4	10.5	94	24	70	1.32	0
4000	9.6	12.9	93	21	72	1.51	0
5000	9.9	15.8	93	17	74	2.54	-
6300	10.5	20.5	91	14	76	4.91	-
8000	11.2	28.2	90	14	73	6.55	-
10000	11.8	36.2	91	15	72	7.31	-

STC Rating **57** (*Sound Transmission Class*)
Deficiencies **28** (*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

SOUND TRANSMISSION LOSS
ASTM E 90

Test Date	04/25/14
Data File No.	D6771.04
Client	ECORE International
Description	7.2 mm Porcelain Tile, 12 mm Ecore International QT4012 Rubber Underlayment, 203 mm Concrete Slab
Specimen Area	10.98 m ²
Technician	Daniel B. Mohler



IMPACT TRANSMISSION
ASTM E 492

Test Date	04/25/14
Data File No.	D6771.04
Client	ECORE International
Description	7.2 mm Porcelain Tile, 12 mm Ecore International QT4012 Rubber Underlayment, 203 mm Concrete Slab
Specimen Area	10.98 m ²
Technician	Daniel B. Mohler

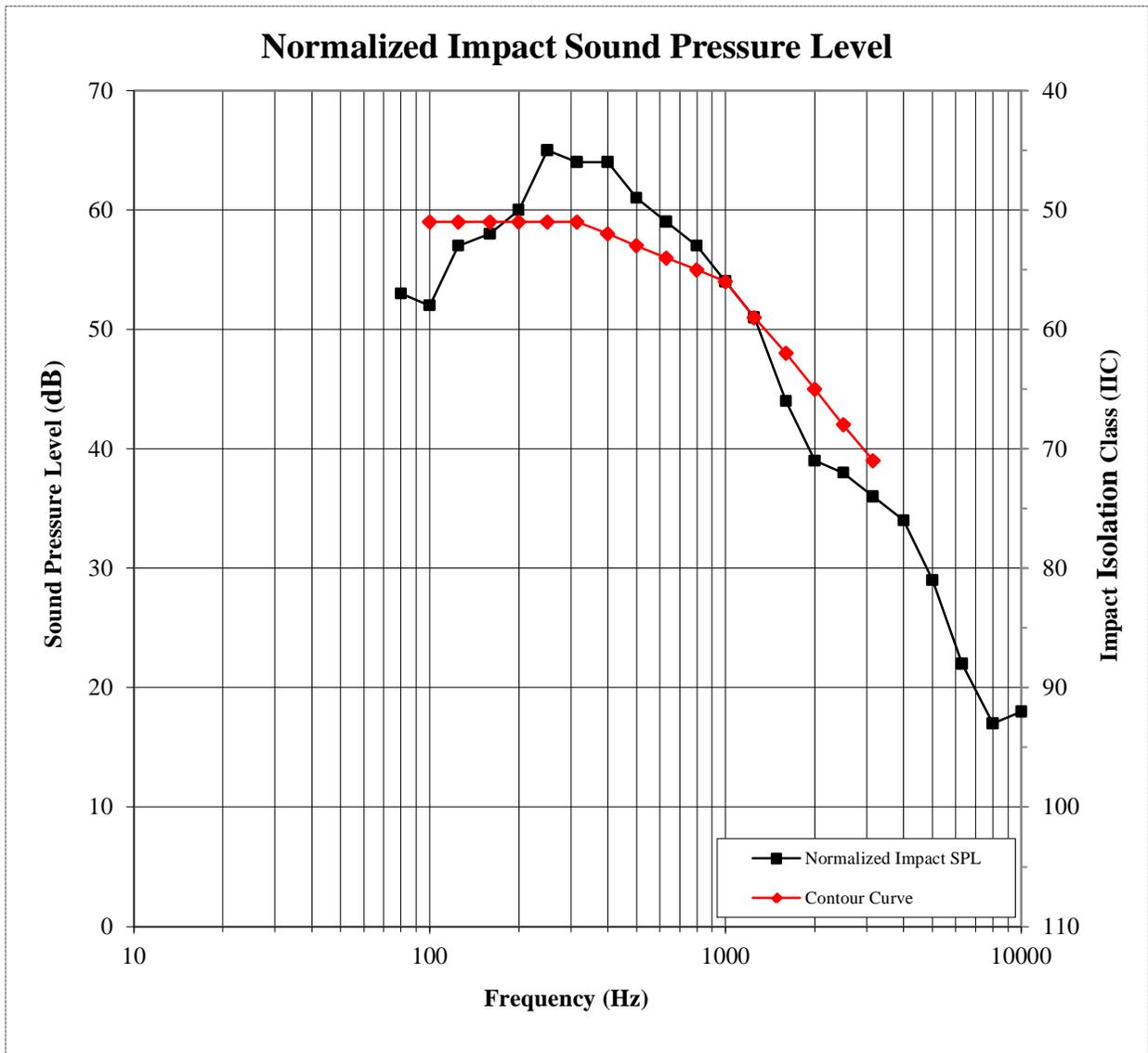
Freq (Hz)	Background SPL (dB)	Absorption (m ²)	Normalized Impact SPL (dB)	95% Confidence Limit	Number of Deficiencies
80	45.7	16.0	53	3.3	-
100	42.5	10.9	52	2.2	0
125	35.7	8.7	57	3.7	0
160	26.4	9.5	58	4.4	0
200	23.6	10.8	60	5.1	1
250	26.9	9.7	65	2.3	6
315	21.2	9.6	64	2.6	5
400	19.1	8.2	64	1.5	6
500	24.9	6.9	61	3.1	4
630	22.2	6.9	59	1.5	3
800	21.5	6.9	57	2.3	2
1000	22.7	7.0	54	1.5	0
1250	19.5	7.0	51	3.6	0
1600	16.1	7.2	44	5.1	0
2000	9.3	8.3	39	4.1	0
2500	7.0	9.3	38	2.5	0
3150	5.3	10.4	36	1.4	0
4000	5.4	12.9	34	1.7	-
5000	5.9	15.6	29	3.1	-
6300	6.3	20.2	22	8.0	-
8000	6.8	27.9	17	13.0	-
10000	7.1	35.6	18	13.2	-

IIC Rating **53** (*Impact Insulation Class*)
Deficiencies **27** (*Sum of Deficiencies*)

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

IMPACT TRANSMISSION
ASTM E 492

Test Date	04/25/14
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Description	7.2 mm Porcelain Tile, 12 mm ECOPE International QT4012 Rubber Underlayment, 203 mm Concrete Slab
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Photographs

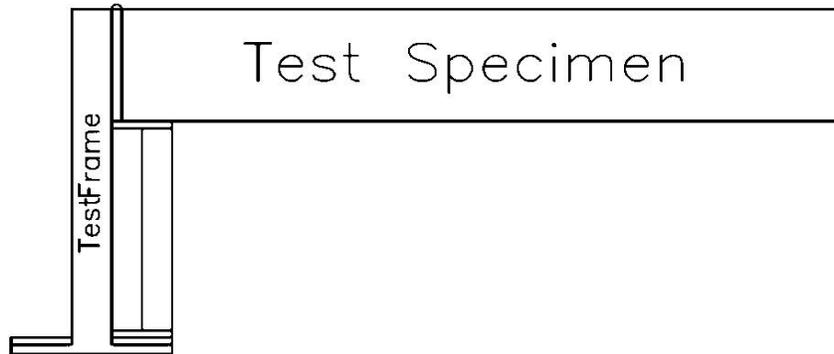


Source Room View of Test Specimen Installation

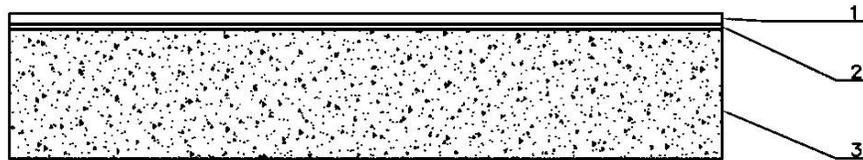


Receive Room View of Test Specimen Installation

Drawings



Test Specimen Installation



Cross Section View of Test Specimen

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