

REGUPOL AMERICA

ACOUSTICAL

PERFORMANCE

TEST REPORT

SCOPE OF WORK

ASTM E90 AND ASTM E492 TESTING ON ENGINEERED WOOD WITH REGUPOL SONUSWAVE UNDERLAYMENT - AMERIFORM NOCOM STRUCTURAL MAGNESIUM BOARD

SPECIMEN TYPE

254 mm Steel C-Joist Assembly with Regupol® SonusClip™ Sound Isolation Clip and Two-Layer Ceiling

REPORT NUMBER

J8051.11-113-11-R0

TEST DATE

06/28/19

ISSUE DATE

09/11/19

RECORD RETENTION END

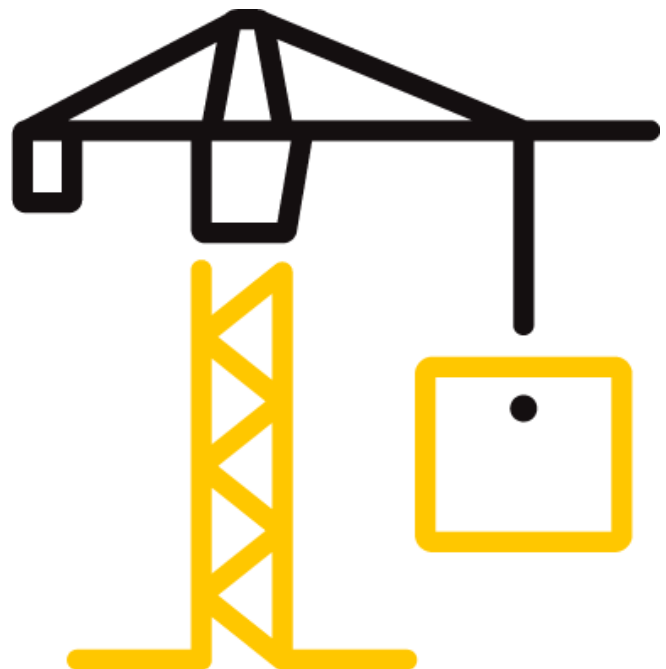
06/28/23

PAGES

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DOCUMENT CONTROL

ATI 00629 (03/21/18)
RTTDS-R-AMER-Test-2844
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Report No.: J8051.11-113-11-R0

Date: 09/11/19

REPORT ISSUED TO

REGUPOL AMERICA

11 Ritter Way

Lebanon, Pennsylvania 17042

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted to perform testing in accordance with ASTM E90 AND ASTM E492 on Engineered Wood with Regupol SonusWave Underlayment - Ameriform NOCOM Structural Magnesium Board. This report is a reissue in the name of Regupol America through written authorization from the original report holder. 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

DATA FILE NO.	J8051.07
SERIES/MODEL:	Engineered Wood with Regupol SonusWave Underlayment - Ameriform NOCOM Structural Magnesium Board
STC	58
IIC	58

COMPLETED BY: David M. Dacheux III
Technician - Acoustical
TITLE: Testing
SIGNATURE:
DATE: 09/11/19

COMPLETED BY: Jordan Strybos
Engineer, Team Lead -
TITLE: Acoustical Testing
SIGNATURE:
DATE: 09/11/19

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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 E989-18, *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 original client were installed on an existing B&C assembly (254 mm Steel C-Joist Assembly with Regupol® SonusClip™ Sound Isolation Clip and Two-Layer Ceiling) 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 698.8 kg. B&C will store samples of the test specimen for four years. Photographs of the test specimen are included in the report. The client did not supply drawings of the test specimen.

This report is reissued in the name of Regupol America through written authorization from the original report holder. The original Report No. is J8051.07-113-11.

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-4462	Data Acquisition Card	INT00977	08/18 *
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	65124	05/18 *
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	63763-1	06/18 *
Microphone Calibrator	Larson Davis	CAL200	Acoustical Calibrator	INT00852	09/18
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63741	04/19
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63739	04/19
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	67340	04/19
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63746	09/18
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63747	07/18
Receive Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63810	10/18
				63811	10/18
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	65029	03/19
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	65586	02/19
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT01089	01/19
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00652	01/19
Source Room Microphone	PCB Electronics	378C20	Microphone and Preamplifier	63742	03/19
Source Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63812	10/18
Tapping Machine	Norsonic	Nor277	Tapping Machine	INT00936	12/18

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

VT RECEIVE ROOM VOLUME	156.8 m ³
VT SOURCE ROOM VOLUME	190 m ³

**SECTION 6
LIST OF OFFICIAL OBSERVERS**

NAME	COMPANY
Seth J. Allen	Intertek B&C
Jordan Strybos	Intertek B&C

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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 average temperature and humidity of both the source and received rooms are listed in Sections 10 and 11. The maximum and minimum temperatures and humidities of the receive room from the duration of the test are listed in Sections 12 and 13.

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. Two 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.

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) and IIC (Impact Insulation Class) ratings were calculated in accordance with ASTM E413 and ASTM E989, respectively.

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SECTION 9

TEST SPECIMEN DESCRIPTION

MATERIAL	DIMENSIONS (mm)	THICKNESS (mm)	MANUFACTURER AND SERIES	QUANTITY	AVERAGE WEIGHT
Engineered Hardwood	Varied by 125	9.1	Shaw Danner 3-1/4	10.98 m ²	7.67 kg/m ²
	Note: Loose laid				
Sound Control Underlayment	3023 by 1219	6.0	Regupol® SonusWave™	10.98 m ²	3.56 kg/m ²
	Note: Loose laid				
Structural Magnesium Board	1219 by 2438	19.2	Ameriform NOCOM	10.98 m ²	19.82 kg/m ²
	Note: Fastened to the floor joists with 41 mm #8 screws spaced on 152.4 mm centers along the perimeter and on 406.4 mm centers in the field				
Fiberglass Insulation	2940 by 406	88.9	Knauf EcoBatt®	10.98 m ²	1.03 kg/m ²
	Note: Laid directly over resilient channels				
Steel C-Joist	3023 by 41.3	254.0	ClarkDietrich S162	6 joists	11.6 kg/joist
	Note: Installed on 610 mm centers using JUS414 hanger brackets				
Resilient Sound Isolation Clip	76.2 by 36.5	31.8	Regupol® SonusClip™	24 clips	0.06 kg/clip
	Note: Installed in a 610 mm by 1219 mm grid pattern				
Furring/Hat Channel	3658 by 76.2	22.3	ClarkDietrich 087F125-18	29.1 lin m	0.48 kg/m
	Note: Installed into the isolation clips, spaced 610 mm on center				
Gypsum Panel	1219 by 3023	15.9	USG SHEETROCK® Brand FIRECODE® C Core	10.98 m ²	11.91 kg/m ²
	Note: Fastened to the channels on 305 mm centers with 25.4 mm Type S bugle head screws. The seams of the gypsum panels were sealed with Pecora AC-20 FTR caulk and covered with pressure sensitive tape.				
Gypsum Panel	1219 by 3023	15.9	USG SHEETROCK® Brand FIRECODE® C Core	10.98 m ²	11.91 kg/m ²
	Note: Fastened to the channels on 305 mm centers with 41.3 mm Type S bugle head screws. The seams of the gypsum panels were sealed with Pecora AC-20 FTR caulk and covered with pressure sensitive tape.				

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SECTION 10

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS



TEST DATE	6/28/2019				
DATA FILE NO.	J8051.07				
CLIENT	Regupol America				
DESCRIPTION	9.1 mm Shaw Danner 3-1/4 Engineered Hardwood, 6 mm Regupol® SonusWave™ Sound Control Underlayment, 19.2 mm Ameriform NOCOM Structural Magnesium Board, 88.9 mm Knauf EcoBatt® Fiberglass Insulation, 254 mm ClarkDietrich S162 Steel C-Joist, 31.75 mm Regupol® SonusClip™ Resilient Sound Isolation Clip, 22.3 mm ClarkDietrich 087F125-18 Furring/Hat Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Receive Temp.	20.4°C	Source Temp.	21.1°C
TECHNICIAN	SJA	Receive Humidity	58%	Source Humidity	58%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	35.9	16.9	107	64	42	2.8	-
100	31.0	10.2	105	67	40	2.7	-
125	28.2	10.8	103	62	43	1.5	0
160	27.8	9.1	105	64	43	1.2	2
200	25.3	10.2	102	57	47	1.3	1
250	18.4	9.9	101	53	50	0.9	1
315	19.2	9.8	104	53	53	0.7	1
400	15.6	8.7	101	52	51	0.5	6
500	18.7	8.1	102	50	53	0.7	5
630	18.4	8.0	103	49	56	0.6	3
800	18.7	8.1	102	45	58	0.4	2
1000	17.9	8.1	102	44	59	0.3	2
1250	16.2	8.1	102	42	61	0.4	1
1600	15.8	8.2	103	40	64	0.3	0
2000	15.1	8.9	103	38	67	0.4	0
2500	16.3	9.9	101	35	67	0.3	0
3150	15.0	10.4	102	32	71	0.5	0
4000	12.7	11.6	103	30	73	0.5	0
5000	11.1	12.9	103	27	76	0.6	-
6300	8.5	15.3	96	17	79	0.9	-
8000	7.3	19.3	96	14	81	1.1	-
10000	7.1	19.3	90	8	81	0.9	-
STC Rating	58	<i>(Sound Transmission Class)</i>			Sum of Deficiencies	24	

- 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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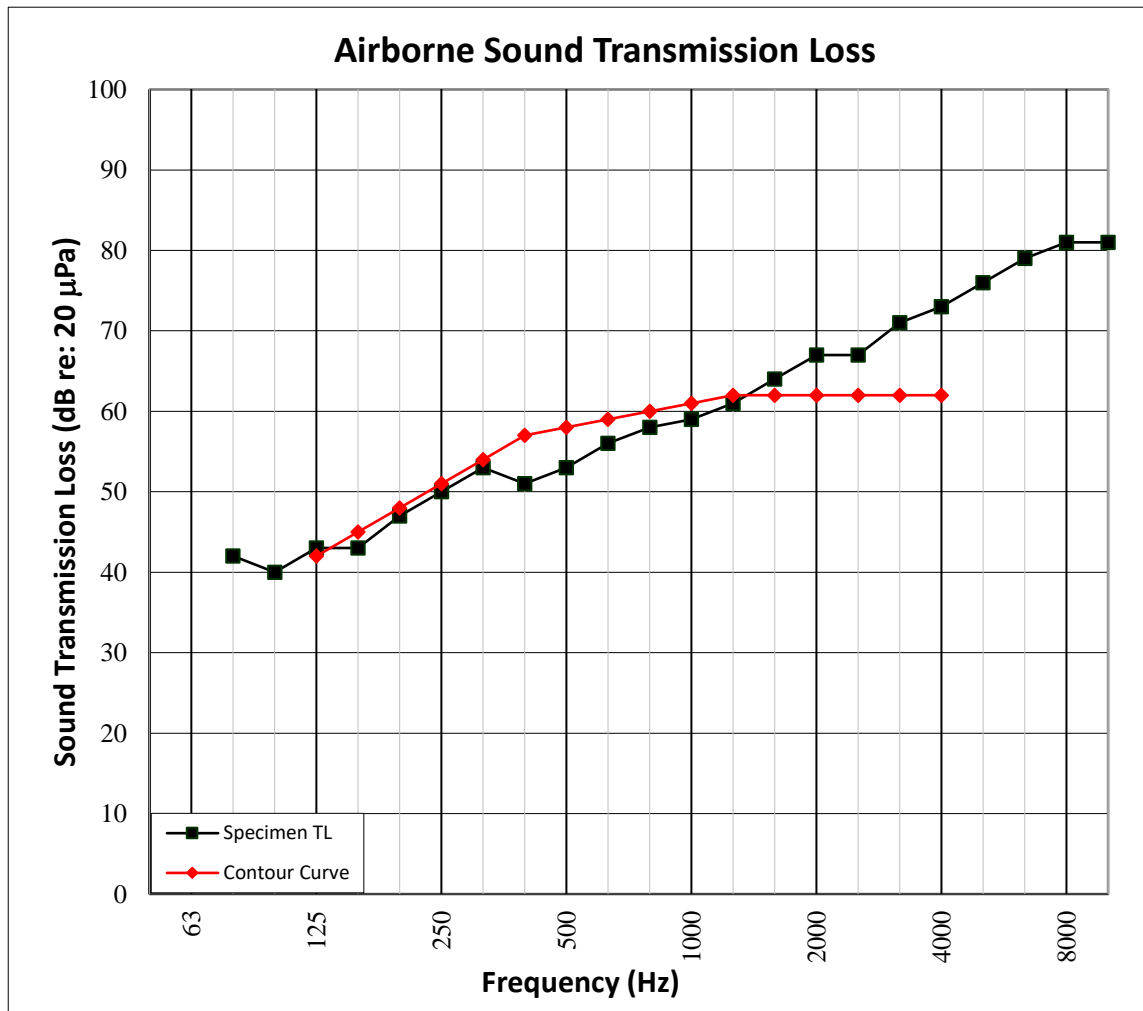
Date: 09/11/19

SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH



TEST DATE	6/28/2019				
DATA FILE NO.	J8051.07				
CLIENT	Regupol America				
DESCRIPTION	9.1 mm Shaw Danner 3-1/4 Engineered Hardwood, 6 mm Regupol® SonusWave™ Sound Control Underlayment, 19.2 mm Ameriform NOCOM Structural Magnesium Board, 88.9 mm Knauf EcoBatt® Fiberglass Insulation, 254 mm ClarkDietrich S162 Steel C-Joist, 31.75 mm Regupol® SonusClip™ Resilient Sound Isolation Clip, 22.3 mm ClarkDietrich 087F125-18 Furring/Hat Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Receive Temp.	20.4°C	Source Temp.	21.1°C
TECHNICIAN	SJA	Receive Humidity	58%	Source Humidity	58%



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SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION



TEST DATE	6/28/2019				
DATA FILE NO.	J8051.07				
CLIENT	Regupol America				
DESCRIPTION	9.1 mm Shaw Danner 3-1/4 Engineered Hardwood, 6 mm Regupol® SonusWave™ Sound Control Underlayment, 19.2 mm Ameriform NOCOM Structural Magnesium Board, 88.9 mm Knauf EcoBatt® Fiberglass Insulation, 254 mm ClarkDietrich S162 Steel C-Joist, 31.75 mm Regupol® SonusClip™ Resilient Sound Isolation Clip, 22.3 mm ClarkDietrich 087F125-18 Furring/Hat Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	20.6°C	Minimum Temp.	20.2°C
TECHNICIAN	SJA	Max. Humidity	59%	Min. Humidity	58%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	NORMALIZED IMPACT SPL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	34.7	16.8	63	2.0	-
100	30.5	11.6	62	1.6	8
125	27.8	11.1	60	1.1	6
160	25.7	9.5	60	0.8	6
200	22.2	10.5	58	0.6	4
250	18.1	10.8	59	1.1	5
315	19.1	9.6	53	0.5	0
400	14.7	8.5	50	0.2	0
500	20.6	7.9	48	0.2	0
630	19.7	8.1	46	0.2	0
800	19.8	8.0	43	0.2	0
1000	16.3	8.2	40	0.2	0
1250	13.1	8.2	37	0.2	0
1600	10.2	8.2	32	0.2	0
2000	9.5	9.1	28	0.2	0
2500	8.1	10.0	24	0.5	0
3150	7.0	10.4	18	0.8	0
4000	6.5	11.7	14	1.0	-
5000	6.3	13.0	11	1.0	-
6300	6.5	15.3	8	0.6	-
8000	6.7	19.5	9	0.6	-
10000	7.0	19.5	8	0.5	-
IIC Rating	58	<i>(Impact Insulation Class)</i>		Sum of Deficiencies	29

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

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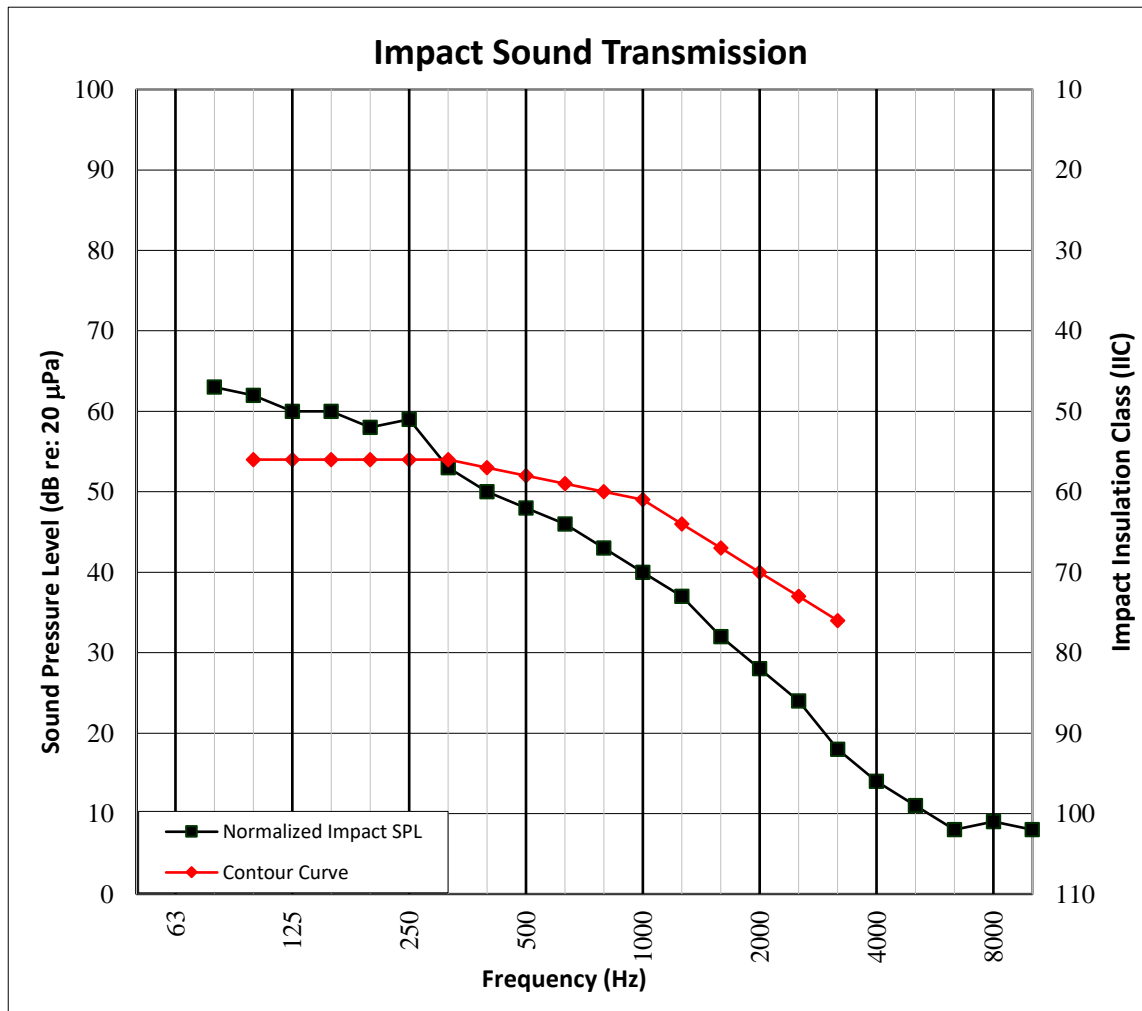
Date: 09/11/19

SECTION 13

TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH



TEST DATE	6/28/2019				
DATA FILE NO.	J8051.07				
CLIENT	Regupol America				
DESCRIPTION	9.1 mm Shaw Danner 3-1/4 Engineered Hardwood, 6 mm Regupol® SonusWave™ Sound Control Underlayment, 19.2 mm Ameriform NOCOM Structural Magnesium Board, 88.9 mm Knauf EcoBatt® Fiberglass Insulation, 254 mm ClarkDietrich S162 Steel C-Joist, 31.75 mm Regupol® SonusClip™ Resilient Sound Isolation Clip, 22.3 mm ClarkDietrich 087F125-18 Furring/Hat Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	20.6°C	Minimum Temp.	20.2°C
TECHNICIAN	SJA	Max. Humidity	59%	Min. Humidity	58%



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SECTION 14

PHOTOGRAPHS



Photo No. 1

Source Room View of Test Specimen Installation



Photo No. 2

Receive Room View of Test Specimen Installation

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SECTION 15

REVISION LOG

REVISION #	DATE	PAGES	DESCRIPTION
R0	09/11/19	N/A	Original Report Issue - Reissue of Report No. J8051.07-113-11 in the name of Regupol America.