REGUPOL AMERICA
ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK
ASTM E90 AND ASTM E492 TESTING ON HYBRID SOLID ENGINEERED HARDWOOD FLOORING OVER 12 MM REGUPOL® SONUS™ OVER 6 MM REGUPOL® SONUS™

SPECIMEN TYPE
Vulcraft EcoSpan - 3.5" Concrete Fill / Regupol® SonusClip™ Ceiling

REPORT NUMBER
L0146.02-113-11-R0

TEST DATE
05/20/20

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06/01/20

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05/20/24

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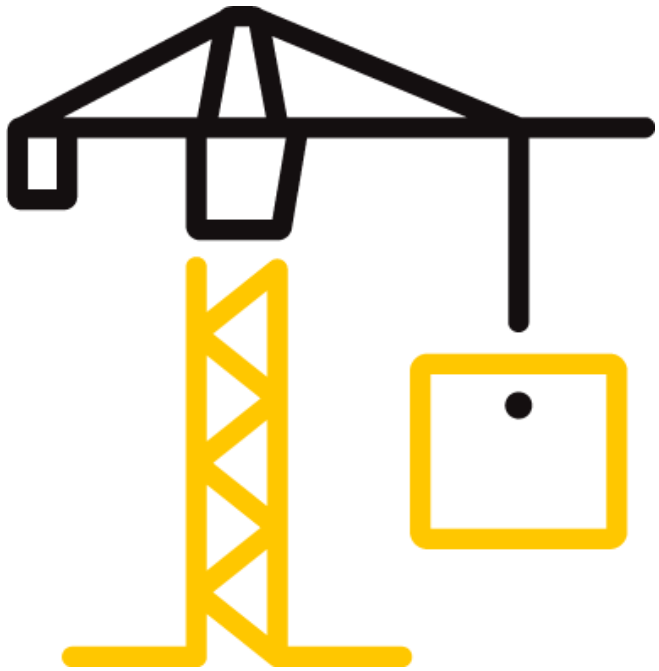

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TEST REPORT FOR REGUPOL AMERICA

Report No.: L0146.02-113-11-R0
Date: 06/01/20

REPORT ISSUED TO

REGUPOL AMERICA
11 Ritter Way
Lebanon, Pennsylvania 17042

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Regupol America to perform testing in accordance with ASTM E90 AND ASTM E492 on Hybrid Solid Engineered Hardwood Flooring over 12 mm Regupol® Sonus™ over 6 mm Regupol® Sonus™. 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.	L0146.02
SERIES/MODEL:	Hybrid Solid Engineered Hardwood Flooring over 12 mm Regupol® Sonus™ over 6 mm Regupol® Sonus™
STC	60
IIC	60

COMPLETED BY:	Cody R. Snyder	**COMPLETED BY:**	Daniel B. Mohler
TITLE:	Technician Team Leader - Acoustical Testing	**TITLE:**	Project Lead - Acoustical Testing
SIGNATURE:	Digitally Signed for: Cody Snyder by Janine Sobell	**SIGNATURE:**	Digitally Signed by: Daniel Mohler
DATE:	06/01/20	**DATE:**	06/01/20

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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 client were installed on an existing B&C assembly (Vulcraft EcoSpan - 3.5" Concrete Fill / Regupol® SonusClip™ 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 2628.6 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.

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	65124	12/18	*
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	63763-4	09/18	*
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	INT01525	04/19	*
Microphone Calibrator	Norsonic	1251	Acoustical Calibrator	65105	06/19	
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	65029	03/20	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63742	03/20	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63747	08/19	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63745	06/19	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	65617	06/19	
Receive Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63810	10/19	
				63811	10/19	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	64903	06/19	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63744	06/19	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	64340	10/19	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63746	10/19	
Source Room Microphone	PCB Electronics	378C20	Microphone and Preamplifier	INT00652	01/20	
Source Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63812	10/19	
Tapping Machine	Look Line s.r.l.	EM50	Tapping Machine	65351	11/19	

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

VT RECEIVE ROOM VOLUME	157.31 m^3
VT SOURCE ROOM VOLUME	190 m^3

SECTION 6
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Seth J. Allen	Intertek B&C
Daniel B. Mohler	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
Hybrid Solid Engineered Hardwood Flooring	Varied by 178	15.1	Alston Inc Casablanca	10.98 m²	8.89 kg/m²
	Note: Adhered to the underlayment with SikaBond T-25 adhesive using a 6.4 mm by 6.4 mm by 3.2 mm square notch trowel. Adhesive was allowed to cure per manufacturer's specifications.				
Rubber Underlayment	1231.9 by 685.8	12.0	Regupol® Sonus™	10.98 m²	9.37 kg/m²
	Note: Loose laid perpendicular to the 6 mm Sonus				
Rubber Underlayment	1231.9 by 685.8	6.0	Regupol® Sonus™	10.98 m²	4.83 kg/m²
	Note: Loose laid				
Normal Weight Concrete	3556 by 2952.8	88.9	N/A	10.98 m²	176.99 kg/m²
	Note: Poured directly on the steel deck, cured for 21 days.				
24ga. G60 Steel Deck	3556 by 2952.8	38.1	Vulcraft 1.0C	10.98 m²	9.28 kg/m²
	Note: Fastened to joists with 76.2 mm (3") by 9.53 mm (3/8") ShearFlex® HD Screws per each deck rib. 24ga.				
Steel Joists	2743.2 by 184.1	406.4	Vulcraft E-Series	3 trusses	57.15 kg/truss
	Note: Installed on 1219.20 mm (48") centers. The joists were model number 16E448\220\60.				
Resilient Sound Isolation Clip	38.1 by 63.5	25.4	Regupol® SonusClip™	22 clips	0.05 kg/clip
	Note: Fastened to the joists 610 mm on center				
25 Gage Furring Channel	3022.6 by 63.6	22.2	Super Stud	21.16 lin m	0.57 kg/m
	Note: Installed into the clips, spaced 610 mm on center. The measured steel thickness is 1.2 mm.				
Fiberglass Insulation	520.7 by 3023	88.9	R-13	10.98 m²	1.32 kg/m²
	Note: Installed in the cavity between trusses on top the furring channel				
Gypsum Panel	1219 by 3023	15.9	USG SHEETROCK® Brand FIRECODE® C Core	10.98 m²	11.91 kg/m²
	Note: Fastened to the furring channels on 305 mm (12") centers with 25.4 mm (1") 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

IAS ACCREDITED Testing Laboratory

TEST DATE	5/20/2020				
DATA FILE NO.	L0146.02				
CLIENT	Regupol America				
DESCRIPTION	15.1 mm Alston Inc Casablanca Hybrid Solid Engineered Hardwood Flooring, 12 mm Regupol® Sonus™ Rubber Underlayment, 6 mm Regupol® Sonus™ Rubber Underlayment, 88.9 mm Normal Weight Concrete, 38.1 mm Vulcraft 1.0C 24ga. G60 Steel Deck, 406.4 mm Vulcraft E-Series Steel Joists, 25.4 mm Regupol® SonusClip™ Resilient Sound Isolation Clip, 22.2 mm Super Stud 25 Gage Furring Channel, 88.9 mm R-13 Fiberglass Insulation, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m²	**Receive Temp.**	18.6°C	**Source Temp.**	21.1°C
TECHNICIAN	SJA	**Receive Humidity**	57%	**Source Humidity**	57%

FREQ (Hz)	**BACKGROUND SPL** (dB)	**ABSORPTION** m²	**SOURCE SPL** (dB)	**RECEIVE SPL** (dB)	**SPECIMEN TL** (dB)	**95% CONFIDENCE LIMIT**	**NUMBER OF DEFICIENCIES**
80	33.6	15.8	100	59	41	3.6	-
100	28.8	12.3	100	61	40	2.1	-
125	31.1	10.4	97	56	43	1.3	1
160	26.3	9.1	97	57	42	1.3	5
200	24.4	10.6	100	54	47	1.9	3
250	29.2	11.4	100	51	50	0.8	3
315	27.0	11.0	98	48	51	1.1	5
400	22.6	9.6	101	46	57	0.9	2
500	23.2	9.0	99	42	59	0.6	1
630	23.6	8.7	100	42	60	0.5	1
800	22.0	9.2	100	41	60	0.6	2
1000	24.0	9.1	99	40	60	0.5	3
1250	22.3	9.2	99	38	62	0.3	2
1600	19.5	9.5	99	38	62	0.6	2
2000	15.5	10.5	99	34	65	0.5	0
2500	13.2	11.3	97	30	68	0.5	0
3150	11.3	12.1	99	27	72	0.7	0
4000	10.8	14.0	100	27	72	0.9	0
5000	10.3	16.1	100	24	75	0.9	-
6300	9.7	20.1	93	12	80	1.1	-
8000	9.9	26.2	93	8	82	1.0	-
10000	9.8	26.2	88	5	80	0.9	-
STC Rating	**60**	*(Sound Transmission Class)*			**Sum of Deficiencies**		**30**

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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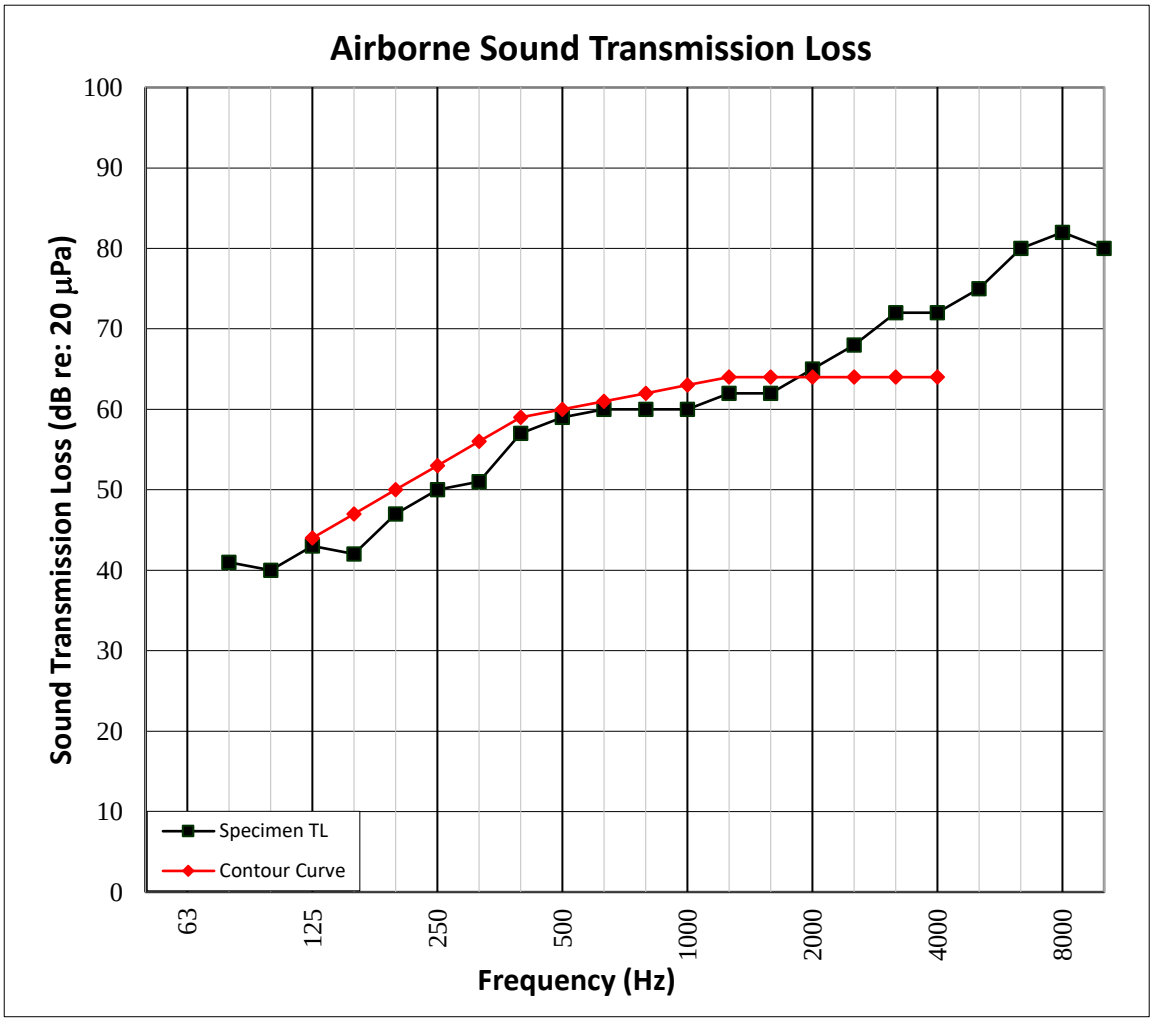
SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH

TEST DATE	5/20/2020				
DATA FILE NO.	L0146.02				
CLIENT	Regupol America				
DESCRIPTION	15.1 mm Alston Inc Casablanca Hybrid Solid Engineered Hardwood Flooring, 12 mm Regupol® Sonus™ Rubber Underlayment, 6 mm Regupol® Sonus™ Rubber Underlayment, 88.9 mm Normal Weight Concrete, 38.1 mm Vulcraft 1.0C 24ga. G60 Steel Deck, 406.4 mm Vulcraft E-Series Steel Joists, 25.4 mm Regupol® SonusClip™ Resilient Sound Isolation Clip, 22.2 mm Super Stud 25 Gage Furring Channel, 88.9 mm R-13 Fiberglass Insulation, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m²	**Receive Temp.**	18.6°C	**Source Temp.**	21.1°C
TECHNICIAN	SJA	**Receive Humidity**	57%	**Source Humidity**	57%



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SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION

TEST DATE	5/20/2020				
DATA FILE NO.	L0146.02				
CLIENT	Regupol America				
DESCRIPTION	15.1 mm Alston Inc Casablanca Hybrid Solid Engineered Hardwood Flooring, 12 mm Regupol® Sonus™ Rubber Underlayment, 6 mm Regupol® Sonus™ Rubber Underlayment, 88.9 mm Normal Weight Concrete, 38.1 mm Vulcraft 1.0C 24ga. G60 Steel Deck, 406.4 mm Vulcraft E-Series Steel Joists, 25.4 mm Regupol® SonusClip™ Resilient Sound Isolation Clip, 22.2 mm Super Stud 25 Gage Furring Channel, 88.9 mm R-13 Fiberglass Insulation, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	19.1°C	**Minimum Temp.**	18.2°C
TECHNICIAN	SJA	**Max. Humidity**	58%	**Min. Humidity**	56%

FREQ (Hz)	**BACKGROUND SPL** (dB)	**ABSORPTION** m²	**NORMALIZED IMPACT SPL** (dB)	**95% CONFIDENCE LIMIT**	**NUMBER OF DEFICIENCIES**
80	33.0	16.2	53	1.9	-
100	27.8	10.5	53	1.6	1
125	30.3	10.9	53	1.0	1
160	25.4	9.9	58	0.7	6
200	22.9	10.0	56	0.8	4
250	28.1	11.3	58	0.7	6
315	24.5	11.2	58	0.7	6
400	21.5	9.7	52	0.7	1
500	20.4	9.0	50	0.5	0
630	23.4	8.8	47	0.4	0
800	24.4	9.2	42	0.6	0
1000	22.9	9.3	39	0.7	0
1250	20.6	9.1	34	0.4	0
1600	17.2	9.4	30	0.5	0
2000	15.3	10.6	24	0.7	0
2500	12.3	11.3	16	0.8	0
3150	11.6	12.2	9	1.0	0
4000	11.0	14.1	7	0.9	-
5000	10.4	16.1	7	0.7	-
6300	9.9	20.0	8	0.7	-
8000	9.9	26.0	9	0.7	-
10000	9.9	26.0	10	0.7	-
IIC Rating	**60**	*(Impact Insulation Class)*		**Sum of Deficiencies**	**25**

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

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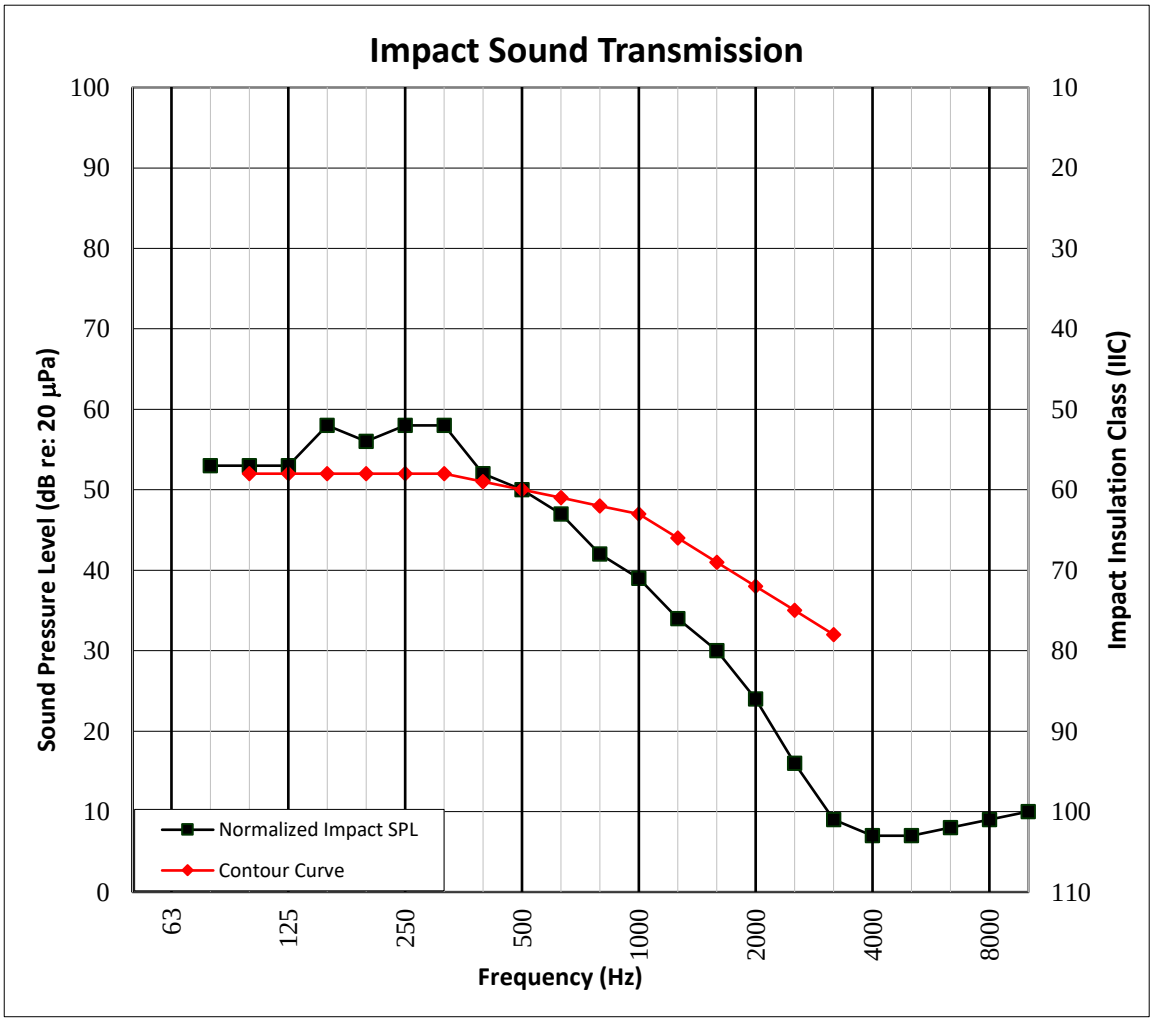
SECTION 13

TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH

TEST DATE	5/20/2020				
DATA FILE NO.	L0146.02				
CLIENT	Regupol America				
DESCRIPTION	15.1 mm Alston Inc Casablanca Hybrid Solid Engineered Hardwood Flooring, 12 mm Regupol® Sonus™ Rubber Underlayment, 6 mm Regupol® Sonus™ Rubber Underlayment, 88.9 mm Normal Weight Concrete, 38.1 mm Vulcraft 1.0C 24ga. G60 Steel Deck, 406.4 mm Vulcraft E-Series Steel Joists, 25.4 mm Regupol® SonusClip™ Resilient Sound Isolation Clip, 22.2 mm Super Stud 25 Gage Furring Channel, 88.9 mm R-13 Fiberglass Insulation, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	19.1°C	**Minimum Temp.**	18.2°C
TECHNICIAN	SJA	**Max. Humidity**	58%	**Min. Humidity**	56%



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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
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