

DMX PLASTICS LIMITED

ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK

ASTM E90 AND ASTM E492 TESTING ON
DMX 1-STEP 2.0 UNDERLAYMENT WITH LUXURY VINYL PLANK

SPECIMEN TYPE

152 mm Concrete Slab with Drop Ceiling

REPORT NUMBER

L0679.04-113-11-R0

TEST DATE

06/13/20

ISSUE DATE

06/29/20

RECORD RETENTION END

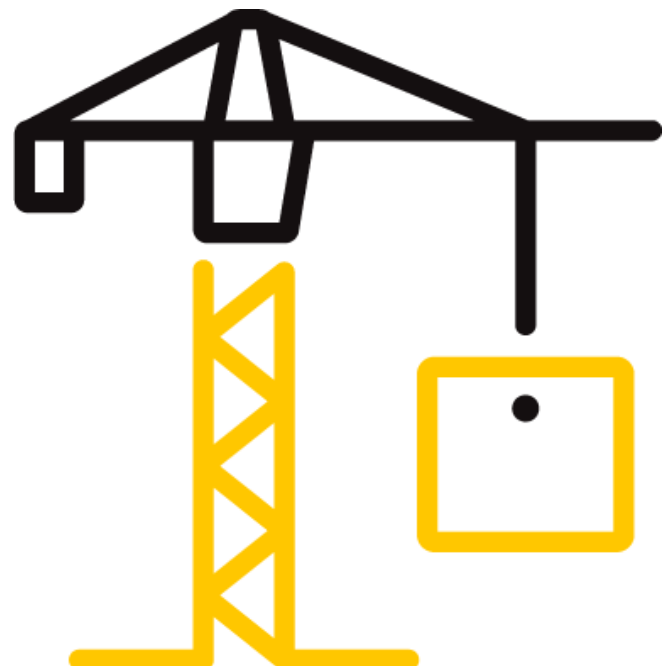
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TEST REPORT FOR DMX PLASTICS LIMITED

Report No.: L0679.04-113-11-R0

Date: 06/29/20

REPORT ISSUED TO

DMX PLASTICS LIMITED

165 Orenda Road

Brampton, Ontario L6W 1W3 CANADA

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by DMX Plastics Limited to perform testing in accordance with ASTM E90 AND ASTM E492 on DMX 1-Step 2.0 Underlayment with Luxury Vinyl Plank. Results obtained are tested values and were secured by using the designated test methods. 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.	L0679.04
SERIES/MODEL:	DMX 1-Step 2.0 Underlayment with Luxury Vinyl Plank
STC	62
IIC	72

COMPLETED BY:	Seth J. Allen
TITLE:	Technician - Acoustical Testing
SIGNATURE:	
DATE:	06/29/20

COMPLETED BY:	Daniel B. Mohler
TITLE:	Project Lead - Acoustical Testing
SIGNATURE:	
DATE:	06/29/20

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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 (152 mm Concrete Slab with Drop 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 4389.9 kg. B&C will store samples of the test specimen for four years. Photographs of the test specimen are included in the report. A drawing of the test specimen is included in the report.

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	155.77 m ³
VT SOURCE ROOM VOLUME	190 m ³

**SECTION 6
LIST OF OFFICIAL OBSERVERS**

NAME	COMPANY
Michael K. Daniel	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
Luxrui Vinyl Plank	190.5 by 1209	7.0	Lifeproof Sawn Oak Grey	10.98 m ²	8.15 kg/m ²
	Note: Loose laid				
Underlayment	3023 by 1066.8	5.0	DMX 1-Step 2.0	10.98 m ²	0.98 kg/m ²
	Note: Loose laid				
Concrete Slab	3023 by 3632	152.4	5000 PSI	10.98 m ²	366.18 kg/m ²
	Note: Installed in a test frame flush to the source room. Mats of #5 reinforcing bars were placed 25.4 mm from both the top and bottom of the slab, with bars spaced on 305 mm centers in both directions. No noticeable shrinkage or cracking was visible on the specimen.				
Drywall Main Beam	38.1 by 2870	43.0	Armstrong HD8906	10.9 lin m	0.45 kg/m
	Note: Twelve gauge hanger wires were attached to the bottom side of the concrete by Acoustivibe CDC Hangers 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. The measured steel thickness was 0.5 mm.				
Cross Tee	38.3 by 1219	37.3	Armstrong XL8945P	27.2 lin m	0.45 kg/m
	Note: Inserted into the main beams on 610 mm centers. The measured steel thickness was 0.5 mm.				
Fiberglass Insulation	609.6 by 2438	88.9	Johns Manville Unfaced R-13	10.98 m ²	1.32 kg/m ²
	Note: Loose laid onto the ceiling grid system				
Gypsum Panel	3023 by 1219	15.9	National Gypsum Gold Bond® Fire-Shield® Type X	10.56 m ²	11.23 kg/m ²
	Note: Fastened with 25.4 mm fine thread drywall screws on 305 mm centers. Seams and perimeter sealed with Pecora AC-20® Acoustical Sealant and covered with pressure-sensitive tape.				
Gypsum Panel	3023 by 1219	15.9	National Gypsum Gold Bond® Fire-Shield® Type X	10.56 m ²	11.23 kg/m ²
	Note: Fastened with 25.4 mm fine thread drywall screws on 305 mm centers. Seams and perimeter sealed with Pecora AC-20® Acoustical Sealant and covered with pressure-sensitive tape.				

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SECTION 10

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS



TEST DATE	6/13/2020				
DATA FILE NO.	L0679.04				
CLIENT	DMX Plastics Limited				
DESCRIPTION	7 mm Lifeproof Sawn Oak Grey Luxrui Vinyl Plank, 5 mm DMX 1-Step 2.0 Underlayment, 152.4 mm 5000 PSI Concrete Slab, 43 mm Armstrong HD8906 Drywall Main Beam, 37.3 mm Armstrong XL8945P Cross Tee, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 15.9 mm National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel, 15.9 mm National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Receive Temp.	23.5°C	Source Temp.	23.7°C
TECHNICIAN	MKD	Receive Humidity	61%	Source Humidity	61%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	34.7	14.4	96	63	33	2.4	-
100	25.7	8.3	94	60	37	2.9	-
125	30.0	8.6	96	57	41	2.6	5
160	21.7	8.4	96	56	43	1.3	6
200	17.2	9.6	97	49	50	1.3	2
250	14.3	9.5	101	50	52	1.3	3
315	17.6	9.9	103	51	53	0.9	5
400	12.2	8.4	102	51	53	0.9	8
500	16.8	8.0	101	43	60	0.5	2
630	16.7	8.2	103	44	62	0.7	1
800	16.9	8.4	103	39	66	0.6	0
1000	17.2	8.3	102	38	66	0.4	0
1250	14.1	8.4	103	37	68	0.7	0
1600	9.8	8.4	103	36	69	0.6	0
2000	7.3	9.1	103	36	69	0.6	0
2500	6.1	10.4	101	34	69	0.5	0
3150	6.0	11.3	102	31	72	0.7	0
4000	5.6	12.3	103	30	74	0.7	0
5000	5.6	14.0	103	27	76	0.8	-
6300	6.3	16.9	97	17	80	0.8	-
8000	6.4	21.7	97	13	82	1.0	-
10000	6.7	21.7	92	7	83	0.8	-
STC Rating	62	<i>(Sound Transmission Class)</i>			Sum of Deficiencies	32	

- 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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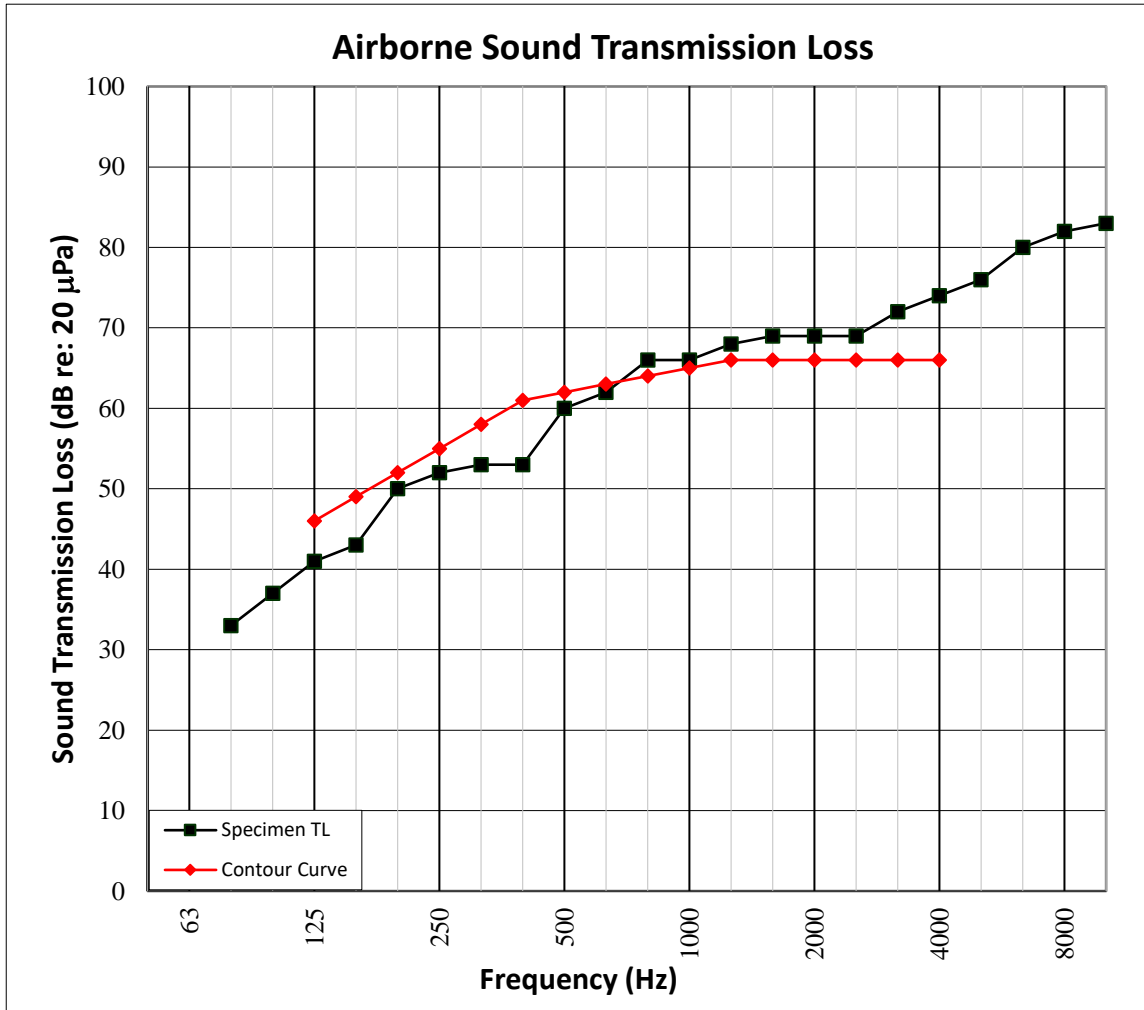
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SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH



TEST DATE	6/13/2020				
DATA FILE NO.	L0679.04				
CLIENT	DMX Plastics Limited				
DESCRIPTION	7 mm Lifeproof Sawn Oak Grey Luxruy Vinyl Plank, 5 mm DMX 1-Step 2.0 Underlayment, 152.4 mm 5000 PSI Concrete Slab, 43 mm Armstrong HD8906 Drywall Main Beam, 37.3 mm Armstrong XL8945P Cross Tee, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 15.9 mm National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel, 15.9 mm National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Receive Temp.	23.5°C	Source Temp.	23.7°C
TECHNICIAN	MKD	Receive Humidity	61%	Source Humidity	61%



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SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION



TEST DATE	6/13/2020				
DATA FILE NO.	L0679.04				
CLIENT	DMX Plastics Limited				
DESCRIPTION	7 mm Lifeproof Sawn Oak Grey Luxrui Vinyl Plank, 5 mm DMX 1-Step 2.0 Underlayment, 152.4 mm 5000 PSI Concrete Slab, 43 mm Armstrong HD8906 Drywall Main Beam, 37.3 mm Armstrong XL8945P Cross Tee, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 15.9 mm National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel, 15.9 mm National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	23.5°C	Minimum Temp.	23.4°C
TECHNICIAN	MKD	Max. Humidity	61%	Min. Humidity	60%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	NORMALIZED IMPACT SPL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	35.5	18.2	45	1.8	-
100	30.0	7.8	44	1.8	4
125	29.3	9.0	44	0.8	4
160	25.4	8.4	46	0.8	6
200	20.1	9.2	43	0.5	3
250	17.3	9.9	42	0.7	2
315	17.4	9.7	45	0.5	5
400	13.9	8.3	42	0.3	3
500	18.5	7.8	37	0.3	0
630	21.2	8.3	29	0.5	0
800	19.0	8.2	24	0.6	0
1000	18.6	8.2	21	0.6	0
1250	17.0	8.3	17	0.5	0
1600	11.6	8.4	10	0.3	0
2000	9.0	9.2	9	0.2	0
2500	7.2	10.4	6	0.3	0
3150	5.3	11.1	4	0.2	0
4000	5.1	12.3	4	0.2	-
5000	5.5	13.9	5	0.2	-
6300	6.0	16.8	6	0.1	-
8000	6.4	21.5	7	0.3	-
10000	6.7	21.5	7	0.3	-
IIC Rating	72	<i>(Impact Insulation Class)</i>		Sum of Deficiencies	27

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

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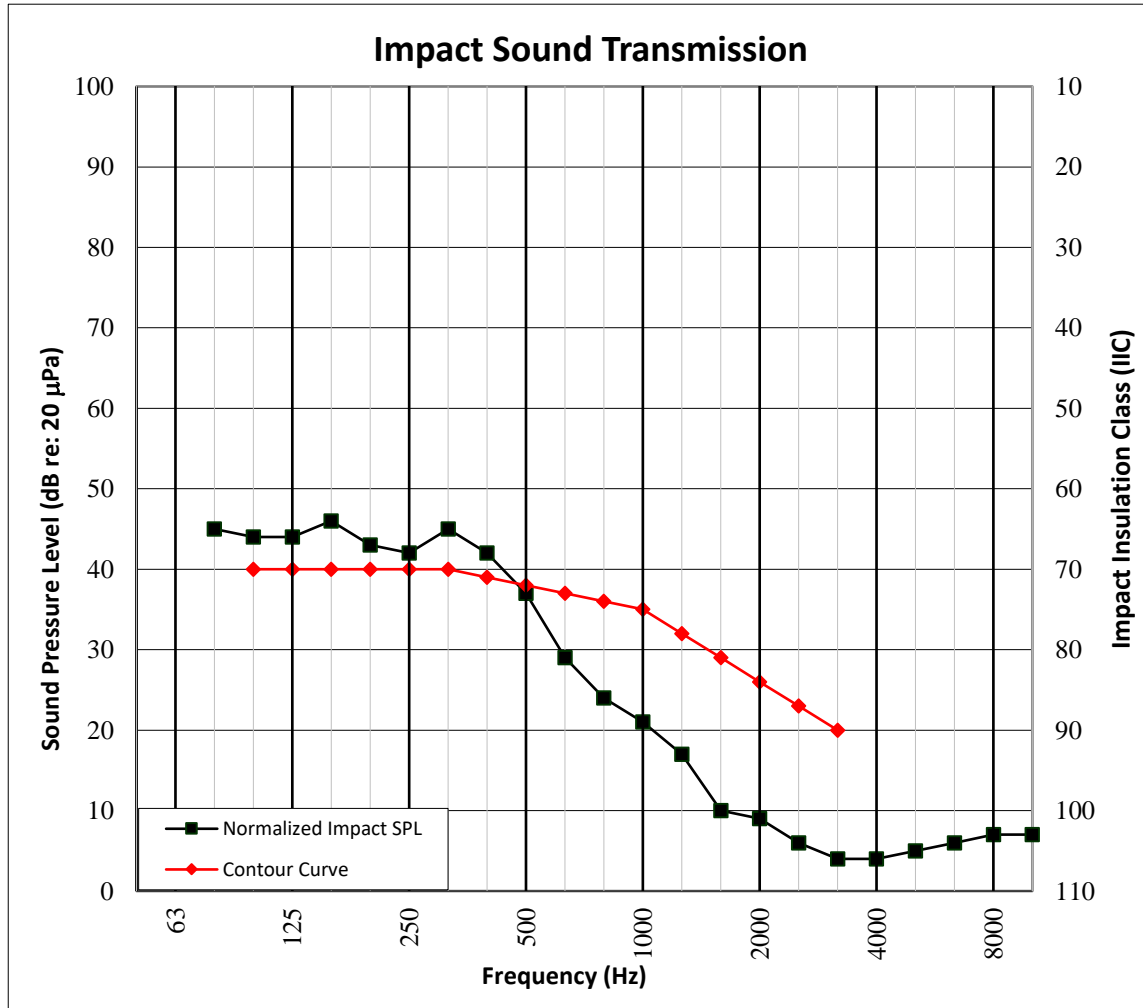
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SECTION 13

TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH



TEST DATE	6/13/2020				
DATA FILE NO.	L0679.04				
CLIENT	DMX Plastics Limited				
DESCRIPTION	7 mm Lifeproof Sawn Oak Grey Luxrui Vinyl Plank, 5 mm DMX 1-Step 2.0 Underlayment, 152.4 mm 5000 PSI Concrete Slab, 43 mm Armstrong HD8906 Drywall Main Beam, 37.3 mm Armstrong XL8945P Cross Tee, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 15.9 mm National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel, 15.9 mm National Gypsum Gold Bond® Fire-Shield® Type X Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	23.5°C	Minimum Temp.	23.4°C
TECHNICIAN	MKD	Max. Humidity	61%	Min. Humidity	60%



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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

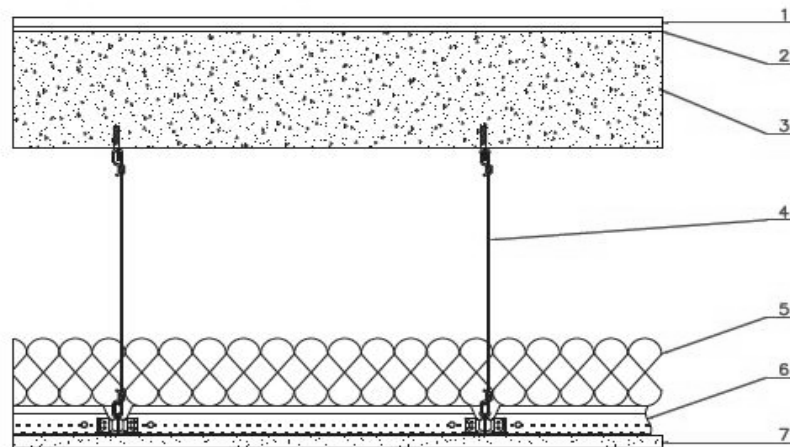
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SECTION 15

DRAWING



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

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SECTION 16

REVISION LOG

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