FALQUON GMBH
ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK
ASTM E90 AND ASTM E492 TESTING ON
FALQUON GMBH 5 MM SPC WITH 1 MM XPS UNDERLAYMENT

SPECIMEN TYPE
203 mm Concrete Slab with Suspended Ceiling

REPORT NUMBER
L8528.01-113-11-R0

TEST DATE
01/16/21

ISSUE DATE
01/19/21

RECORD RETENTION END
01/16/25

PAGES
15

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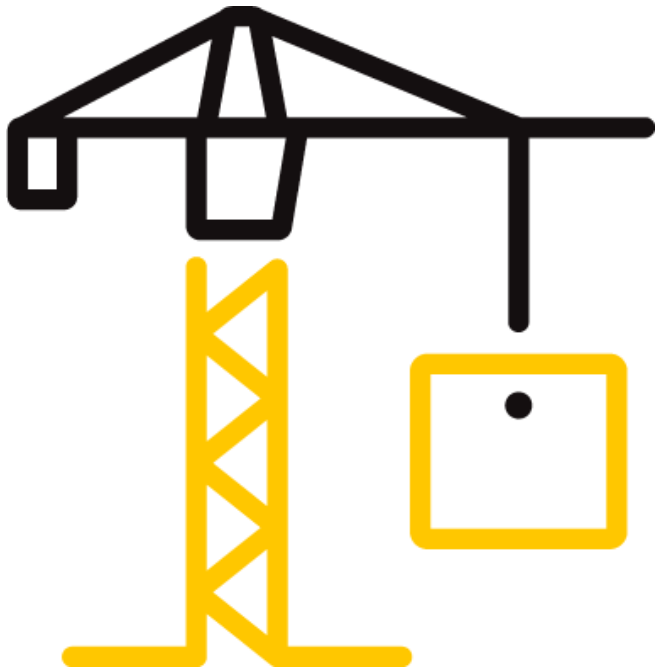

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TEST REPORT FOR FALQUON GMBH

Report No.: L8528.01-113-11-R0
Date: 01/19/21

REPORT ISSUED TO

FALQUON GMBH
Am Hünengrab 18
16928, Pritzwalk GERMANY

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Falquon GmbH to perform testing in accordance with ASTM E90 AND ASTM E492 on Falquon GmbH 5 mm SPC with 1 mm XPS Underlayment. 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.	L8528.01
SERIES/MODEL:	Falquon GmbH 5 mm SPC with 1 mm XPS Underlayment
STC	62
IIC	68
HIIC	73

COMPLETED BY:	Michael A. Unnone	**COMPLETED BY:**	Daniel B. Mohler
TITLE:	Technician - Acoustical Testing	**TITLE:**	Project Lead - Acoustical Testing
SIGNATURE:	Digitally Signed by: Michael Unnone	**SIGNATURE:**	Digitally Signed by: Daniel Mohler
DATE:	01/19/21	**DATE:**	01/19/21

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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 (2020), *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*

ASTM E3222-20, *Standard Classification for Determination of High-Frequency Impact Sound Ratings*

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 (203 mm Concrete Slab with Suspended 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 6014.7 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	INT01524	04/19	*
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	INT01525	04/19	*
Microphone Calibrator	Norsonic	1251	Acoustical Calibrator	65105	09/20	
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	INT01089	01/20	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63740	04/20	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63739	04/20	
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	63741	06/20	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	65969	04/20	
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	Norsonic	Nor277	Tapping Machine	INT00936	01/20	

* 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
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), IIC (Impact Insulation Class), and HIIC (High-Frequency Impact Insulation Class) ratings were calculated in accordance with ASTM E413, ASTM E989, and ASTM E3222, respectively.

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SECTION 9

TEST SPECIMEN DESCRIPTION

MATERIAL	DIMENSIONS (mm)	THICKNESS (mm)	MANUFACTURER AND SERIES	QUANTITY	AVERAGE WEIGHT
SPC with XPS Underlayment	800 by 400	6.0	Falquon GmbH	10.98 m²	9.42 kg/m²
	Note: Loose laid. The SPC was 5 mm and the attached underlayment was 1 mm.				
Concrete Slab	3023 by 3632	203.2	5000 PSI	10.98 m²	524.71 kg/m²
	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 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 m²	1.32 kg/m²
	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 m²	11.23 kg/m²
	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

IAS ACCREDITED Testing Laboratory

TEST DATE	1/16/2021				
DATA FILE NO.	L8528.01				
CLIENT	Falquon GmbH				
DESCRIPTION	6 mm Falquon GmbH SPC with XPS Underlayment, 203.2 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				
SPECIMEN AREA	10.98 m²	**Receive Temp.**	18.9°C	**Source Temp.**	17°C
TECHNICIAN	SJA	**Receive Humidity**	47%	**Source Humidity**	47%

FREQ (Hz)	**BACKGROUND SPL** (dB)	**ABSORPTION** m²	**SOURCE SPL** (dB)	**RECEIVE SPL** (dB)	**SPECIMEN TL** (dB)	**95% CONFIDENCE LIMIT**	**NUMBER OF DEFICIENCIES**
80	28.6	15.5	98	63	35	2.6	-
100	26.2	9.7	95	59	38	2.6	-
125	20.7	11.1	97	56	42	2.3	4
160	17.7	10.2	96	55	43	1.2	6
200	14.9	11.0	97	48	51	1.1	1
250	12.4	11.2	101	49	53	1.2	2
315	15.3	11.5	105	51	55	1.1	3
400	10.2	9.4	104	47	58	0.8	3
500	11.0	9.2	102	46	58	0.7	4
630	14.7	8.5	104	45	61	0.8	2
800	16.9	8.5	104	43	63	0.4	1
1000	15.9	8.7	103	40	65	0.6	0
1250	12.8	8.9	104	38	68	0.5	0
1600	9.9	9.1	104	38	68	0.5	0
2000	8.9	10.3	104	37	68	0.5	0
2500	6.2	11.4	102	34	69	0.6	0
3150	5.2	12.5	103	31	72	0.4	0
4000	5.2	14.8	104	30	73	0.5	0
5000	5.8	17.1	104	26	76	0.6	-
6300	7.1	21.6	97	17	78	1.1	-
8000	6.8	28.0	97	13	81	1.2	-
10000	7.0	28.0	92	7	82	0.6	-
STC Rating	**62**	*(Sound Transmission Class)*			**Sum of Deficiencies**		**26**

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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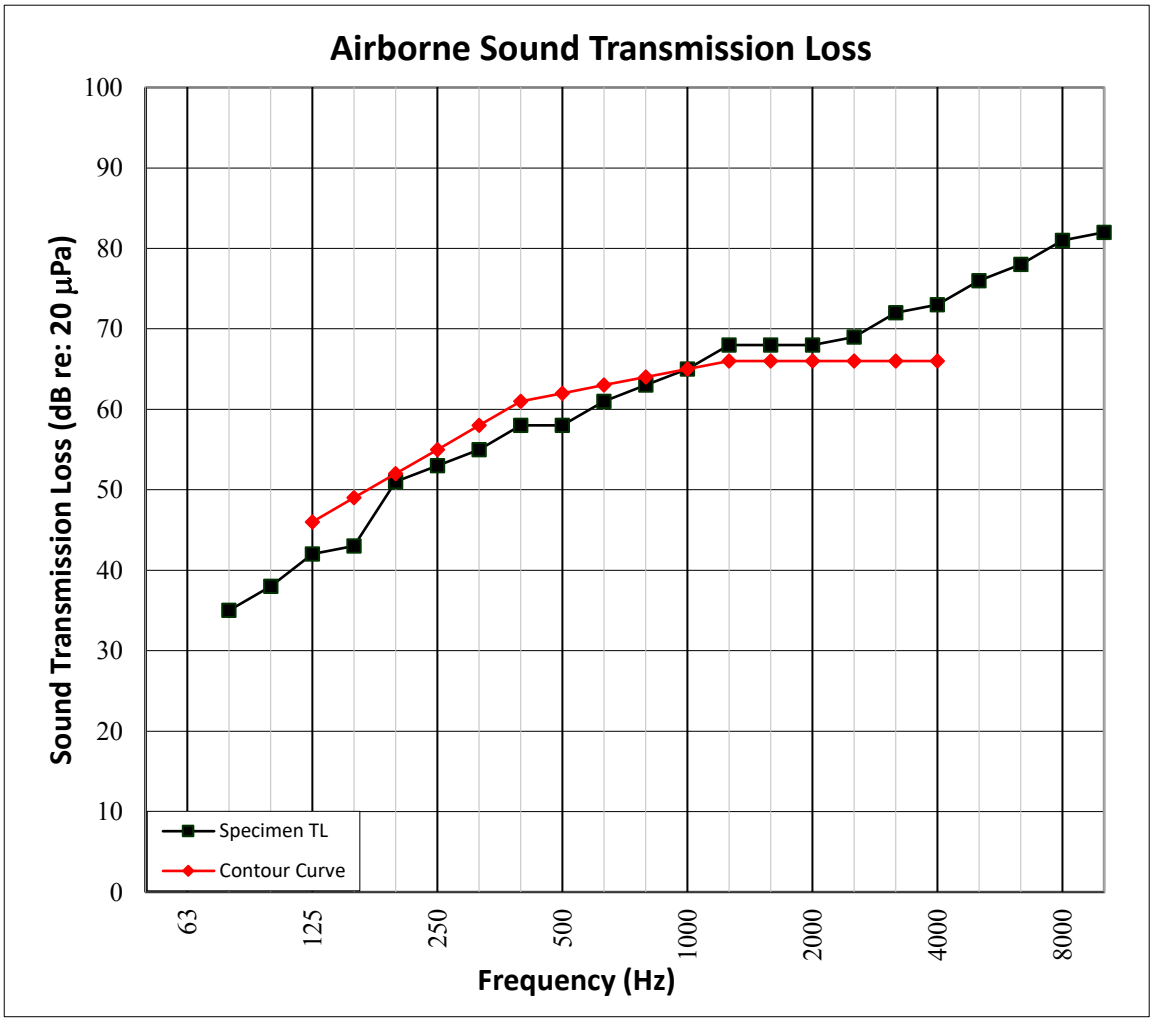
Date: 01/19/21

SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH

TEST DATE	1/16/2021				
DATA FILE NO.	L8528.01				
CLIENT	Falquon GmbH				
DESCRIPTION	6 mm Falquon GmbH SPC with XPS Underlayment, 203.2 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				
SPECIMEN AREA	10.98 m²	**Receive Temp.**	18.9°C	**Source Temp.**	17°C
TECHNICIAN	SJA	**Receive Humidity**	47%	**Source Humidity**	47%



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SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION

IAS ACCREDITED Testing Laboratory

TEST DATE	1/16/2021				
DATA FILE NO.	L8528.01				
CLIENT	Falquon GmbH				
DESCRIPTION	6 mm Falquon GmbH SPC with XPS Underlayment, 203.2 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				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	19.1°C	**Minimum Temp.**	18.8°C
TECHNICIAN	SJA	**Max. Humidity**	48%	**Min. Humidity**	47%

FREQ (Hz)	**BACKGROUND SPL** (dB)	**ABSORPTION** m²	**NORMALIZED IMPACT SPL** (dB)	**95% CONFIDENCE LIMIT**	**NUMBER OF DEFICIENCIES**
80	31.1	15.5	46	2.2	-
100	25.9	9.1	51	2.2	7
125	22.4	10.7	49	1.3	5
160	22.1	9.7	46	0.9	2
200	18.4	10.6	46	0.9	2
250	14.3	11.1	49	0.8	5
315	16.5	11.6	48	0.8	4
400	11.8	9.4	43	0.8	0
500	13.7	8.9	42	0.4	0
630	16.8	8.7	37	0.3	0
800	18.3	8.7	38	0.4	0
1000	17.3	8.5	35	0.3	0
1250	14.2	8.9	29	0.3	0
1600	11.2	9.2	24	0.4	0
2000	10.1	10.1	13	0.5	0
2500	7.3	11.3	9	0.4	0
3150	6.0	12.6	7	0.7	0
4000	5.6	14.7	6	0.7	-
5000	6.1	17.2	7	0.6	-
6300	7.3	21.5	9	0.4	-
8000	7.0	28.2	10	0.4	-
10000	7.1	28.2	10	0.4	-
IIC Rating	**68**	*(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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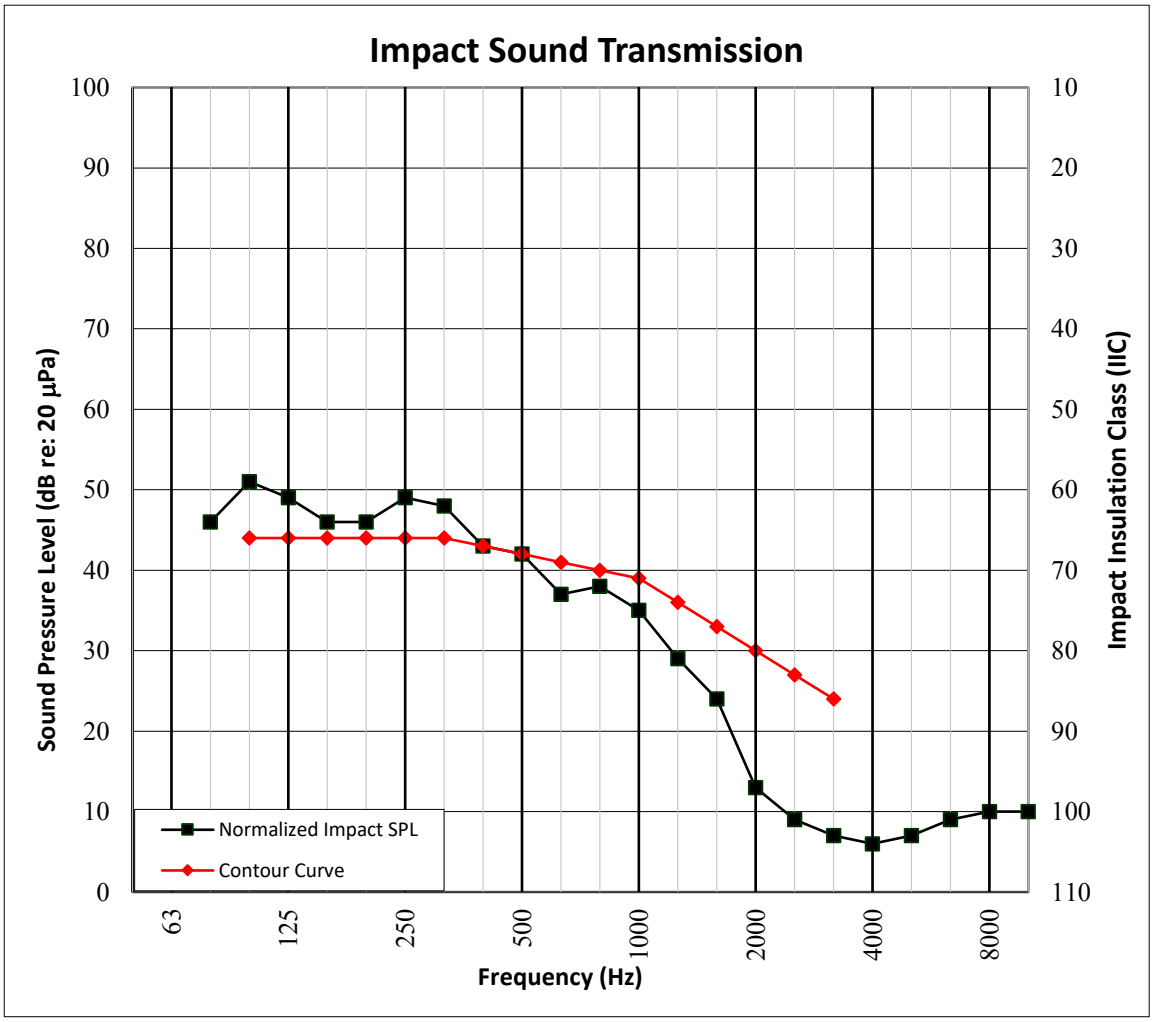
SECTION 13

TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH

TEST DATE	1/16/2021				
DATA FILE NO.	L8528.01				
CLIENT	Falquon GmbH				
DESCRIPTION	6 mm Falquon GmbH SPC with XPS Underlayment, 203.2 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				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	19.1°C	**Minimum Temp.**	18.8°C
TECHNICIAN	SJA	**Max. Humidity**	48%	**Min. Humidity**	47%



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SECTION 14

TEST RESULTS - HIGH-FREQUENCY IMPACT SOUND TRANSMISSION

TEST DATE	1/16/2021				
DATA FILE NO.	L8528.01				
CLIENT	Falquon GmbH				
DESCRIPTION	6 mm Falquon GmbH SPC with XPS Underlayment, 203.2 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				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	19.1°C	**Minimum Temp.**	18.8°C
TECHNICIAN	SJA	**Max. Humidity**	48%	**Min. Humidity**	47%

FREQ (Hz)	**BACKGROUND SPL** (dB)	**ABSORPTION** m²	**NORMALIZED IMPACT SPL** (dB)	**95% CONFIDENCE LIMIT**	**NUMBER OF DEFICIENCIES**
400	11.8	9.4	43	0.8	5.1
500	13.7	8.9	42	0.4	5.1
630	16.8	8.7	37	0.3	1.4
800	18.3	8.7	38	0.4	2.8
1000	17.3	8.5	35	0.3	1.2
1250	14.2	8.9	29	0.3	0.0
1600	11.2	9.2	24	0.4	0.0
2000	10.1	10.1	13	0.5	0.0
2500	7.3	11.3	9	0.4	0.0
3150	6.0	12.6	7	0.7	0.0
HIIC Rating	**73**	*(High-Frequency Impact Insulation Class)*		**Sum of Deficiencies**	**15.6**

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

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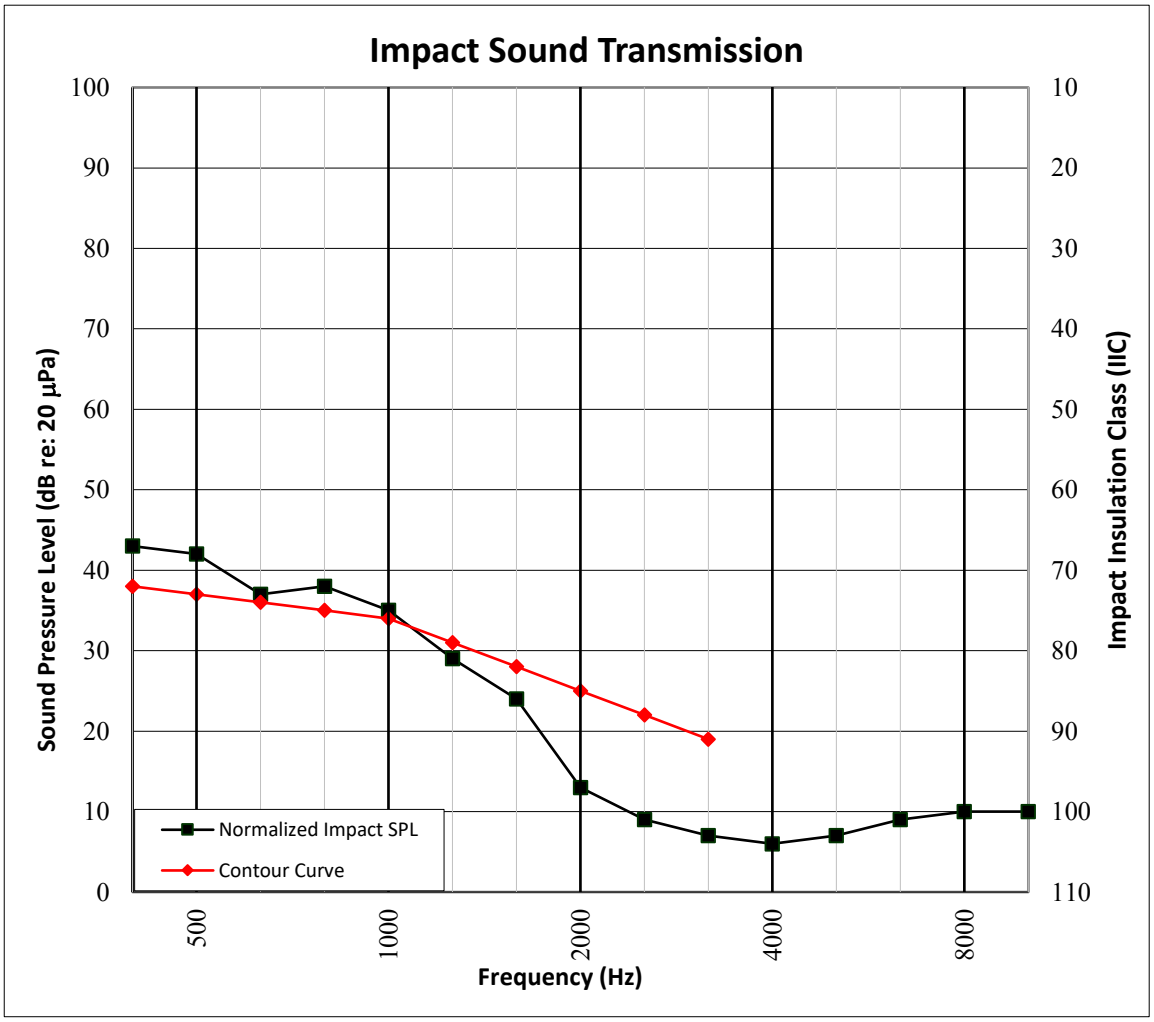
SECTION 15

TEST RESULTS -HIGH-FREQUENCY IMPACT SOUND TRANSMISSION GRAPH

TEST DATE	1/16/2021				
DATA FILE NO.	L8528.01				
CLIENT	Falquon GmbH				
DESCRIPTION	6 mm Falquon GmbH SPC with XPS Underlayment, 203.2 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				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	19.1°C	**Minimum Temp.**	18.8°C
TECHNICIAN	SJA	**Max. Humidity**	48%	**Min. Humidity**	47%



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SECTION 16
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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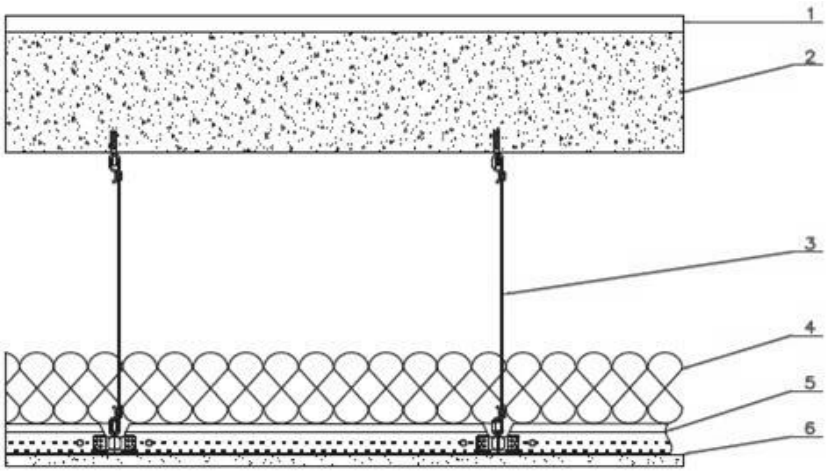
SECTION 17
DRAWING



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

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SECTION 18
REVISION LOG

REVISION #	DATE	PAGES	DESCRIPTION
R0	01/19/21	N/A	Original Report Issue