Karitma Oy
Antti Pajatsalo
Sorvaajankatu 15
00880 HELSINKI
antti.pajatsalo@karitma.fi

FINAS
Finnish Accreditation Service
T293 (EN ISO/IEC 17025)

DETERMINATION OF IMPACT SOUND INSULATION IN LABORATORY CONDITIONS

1 CLIENT

Karitma Oy, Antti Pajatsalo. Tender December 2, 2024. Order date December 13, 2024.

2 DESCRIPTION OF THE COMMISSION

Normalized impact sound pressure level, L_n (50–5000 Hz), was measured using tapping machine for specimen according to ISO 10140-3:2022. Weighted normalized impact sound pressure level, $L_{n,w}$, was determined according to ISO 717-2:2020.

The reduction of impact sound pressure level (improvement of impact sound insulation), ΔL, was determined according to ISO 10140-1:2021 Annex H within 50–5000 Hz. Weighted reduction in impact sound pressure level, ΔL_w, was determined according to ISO 717-2:2020.

3 RESULTS

The test results are summarized in Table 1. Detailed results are presented in Annex 1. The test results are valid only for the tested items.

Table 1. Weighted reduction in impact sound pressure level ΔL_w [dB].

Specimen	ΔL_w [dB]
KronoTex Superior/Stella Advanced Laminate + KronoTex Basic plus	18
Karitma Premium Vinyl plank	18

4 SIGNATURES

Valtteri Hongisto
Research Group Leader

Arto Lehtonen
Research Engineer

Turku University of Applied Sciences
Acoustics Laboratory

ANNEXES

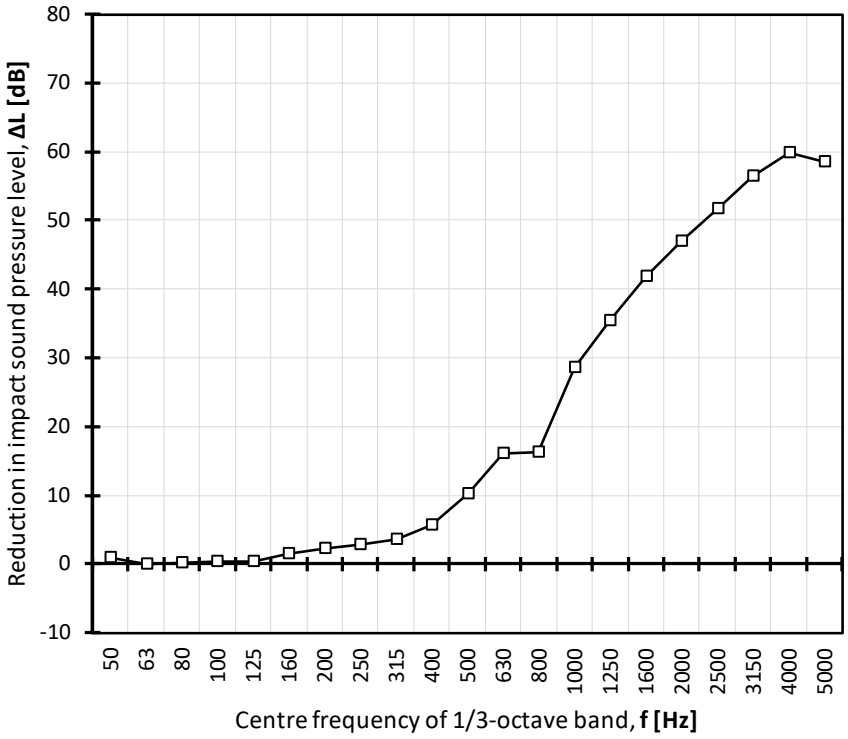
Annex 1 – Test results (2 pages)
Annex 2 – Structure drawings (1 pages)
Annex 3 – Mounting of specimen (1 pages)
Annex 4 – Measurement arrangements (2 pages)

Weighted reduction in impact sound pressure level (ISO 10140-3, ISO 717-2)

Floor covering:	KronoTex Superior/Stella Advanced Laminate + KronoTex Basic plus Thicness: Laminate 8 mm + Sound-proofing mat 2 mm
Manufacturer:	Swiss KronoTex
Reference floor:	160 mm thick steel-reinforced concrete slab (406 kg/m2), test opening D
Client:	Karitma Oy
Contact person:	Antti Pajatsalo
Mounting by:	Antti Pajatsalo
Test laboratory:	Turku University of Applied Sciences, Acoustics Laboratory Joukahaisenkatu 7, FI-20520 Turku, Finland.

Room temperature:	20.99 °C	Area of test element, S:	9.8 m^2
Relative humidity:	26.8 %	Mass per unit area:	7.1 kg/m^2
Barometric pressure:	100.7 hPa	Mounting date:	18.12.2024
Receiving room volume:	71.3 m^3	Test date, specimen:	18.12.2024
Test file:	Ln181224A	Test date, reference floor:	17.12.2024

f [Hz]	ΔL [dB]	
50	0.9	
63	-0.1	
80	0.2	
100	0.4	
125	0.4	
160	1.5	
200	2.3	
250	2.8	
315	3.5	
400	5.7	
500	10.2	
630	16.1	
800	16.2	
1000	28.6	
1250	35.4	
1600	41.7	
2000	46.9	
2500	51.7	
3150	56.4	
4000	59.9	B
5000	58.5	B



Weighted reduction of impact sound pressure level according to ISO 717-2:

ΔL_w	18	dB
$C_{I,\Delta}$	-11	dB
ΔL_{lin}	7	dB

At frequencies marked by B,
the declared result is an underestimate.
The true value may be larger.

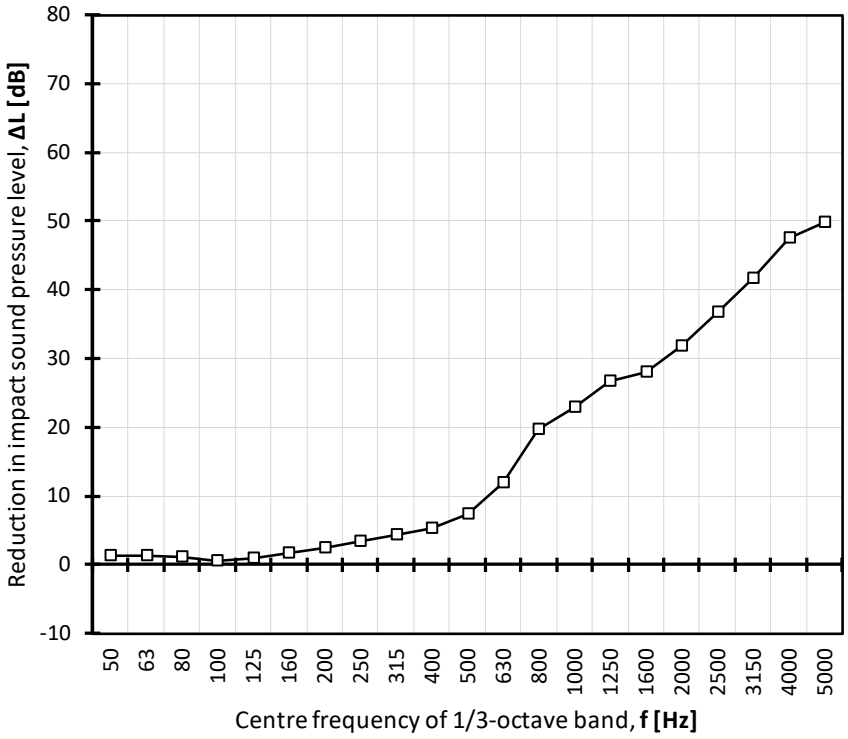
Arto Lehtonen
research engineer
test performer

Weighted reduction in impact sound pressure level (ISO 10140-3, ISO 717-2)

Floor covering:	Karitma Premium Vinyl plank Thickness 5,5 mm (4,5 mm + 1 mm IXPE)
Manufacturer:	Karitma Oy
Reference floor:	160 mm thick steel-reinforced concrete slab (406 kg/m2), test opening D
Client:	Karitma Oy
Contact person:	Antti Pajatsalo
Mounting by:	Antti Pajatsalo
Test laboratory:	Turku University of Applied Sciences, Acoustics Laboratory Joukahaisenkatu 7, FI-20520 Turku, Finland.

Room temperature:	21.07 °C	Area of test element, S:	9.8 m^2
Relative humidity:	26.8 %	Mass per unit area:	9.2 kg/m^2
Barometric pressure:	100.6 hPa	Mounting date:	18.12.2024
Receiving room volume:	71.3 m^3	Test date, specimen:	18.12.2024
Test file:	Ln181224B	Test date, reference floor:	17.12.2024

f [Hz]	ΔL [dB]
50	1.3
63	1.2
80	1.1
100	0.6
125	0.9
160	1.8
200	2.4
250	3.4
315	4.3
400	5.2
500	7.3
630	12.0
800	19.7
1000	22.8
1250	26.7
1600	27.9
2000	31.8
2500	36.8
3150	41.6
4000	47.5
5000	49.8



Weighted reduction of impact sound pressure level according to ISO 717-2:

ΔL_w	18	dB
$C_{I,\Delta}$	-11	dB
ΔL_{lin}	7	dB

At frequencies marked by B,
the declared result is an underestimate.
The true value may be larger.

Arto Lehtonen
research engineer
test performer

ANNEX 2 – STRUCTURE DRAWINGS

The client did not provide specific structure drawing for the product. The specimen is described in Annex 1 and 3.

ANNEX 3 – MOUNTING OF SPECIMEN

The specimen was mounted on top of the reference slab (steel-reinforced concrete 160 mm) in the test opening D (4100 x 2500 mm). The size of specimen area was 9,83 m^2. Figures A3.1 - A3.2 show views of installations.

Figure A3.1. The specimens mounted on top of the reference slab in the test opening D. In the picture KronoTex Superior/Stella Advanced Laminate + KronoTex Basic plus sound proofing mat.

Figure A3.2. The specimens mounted on top of the reference slab in the test opening D. In the picture Karitma Premium Vinyl plank.

ANNEX 4 – MEASUREMENT ARRANGEMENTS

1 Acoustical measurements

The standard tapping machine (Norsonic 277, serialnr. 2775721) was used to simulate impact source (e.g. person walking with shoes). The sound level in the receiving room was measured using the rotating microphone boom (Brüel&Kjær 3923, serialnr. 2036590), the condenser microphone (Brüel&Kjær 4165, serialnr. 1867292), and the preamplifier (Brüel&Kjær 2669, serialnr. 1866352). The radius of rotation was 100 cm. The averaging time was 64 seconds. The microphone and the measurement channel were calibrated before the measurements with a sound level calibrator (Brüel&Kjær 4231, serialnr. 2376479). The measurements were repeated six times using tapping machine in different positions.

For the reverberation time measurement in the receiving room, the pink noise test signal was produced with the real time analyzer (Norsonic 121, serialnr. 31416) and amplified with a terminal amplifier (QSC 900 W USA). Two fixed loudspeaker positions were used, and the microphone was placed in three positions. The reverberation time was determined in conformance with ISO 3382-2:2008 using 2 averaged decay signals from the decay range of –5 to -25 dB in each measurement. The sound analysis was made with the two-channel real time analyzer (Norsonic 121, serialnr. 31416).

The acoustical measurement equipment does not fulfil the requirements of IEC 61672, because the manufacturer has not tested the real time analyzer in conformance with IEC 61672-1 and 2.
The acoustical measurement equipment fulfilled the following IEC standards and grades of accuracy:

IEC 60651	Sound level meters (replaced by IEC 61672)	**type 1**
IEC 60804	Integrating sound level meters (replaced by IEC 61672)	**type 1**
IEC 61260	Octave-band and fractional-octave-band filters	**class 1**
IEC 60942	Sound level calibrators	**class 1**

2 Other measurements

The temperature and the relative humidity of the receiving room were measured using an environmental measurement device (Thermo Recorder TR-73U, serialnr. E00009). The elements of the specimen were weighed with a weighing machine (Vetek TI-500 SL, serialnr. 47359). The dimensions of the specimen were measured with a roll meter (Stanley Fat Max).

3 The uncertainty of sound insulation measurement

The uncertainty of reproducibility expresses the differences between the laboratories. The laboratory has not participated in interlaboratory comparisons. Therefore, the uncertainty of the test results is assumed to be in conformance with ISO 12999-1 (Figure A4.1).

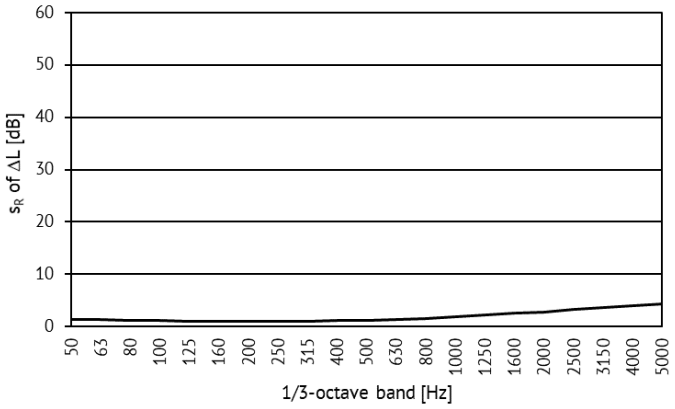


Figure A4.1. Standard reproducibility uncertainty s_R of reduction in impact sound pressure level ΔL according to ISO 12999-1.

4 Determination of reduction in impact sound pressure level

The reduction of impact sound pressure level, ΔL, of a floor covering is independent of the normalized impact sound pressure level of the bare floor when it is tested on a homogeneous concrete slab. However, the weighted normalized impact sound pressure level of the floor with and without the floor covering depend to some extent on the normalized impact sound pressure level of the bare floor. Therefore, the measured values of ΔL are related to a reference floor (Table 4, ISO 717-2:2020) to obtain comparable values of ΔL_w between laboratories.

Weighted reduction in impact sound pressure level, ΔL_w, was determined according to ISO 717-2:2020 within 100 - 3150 Hz using heavy reference floor ($L_{n,r,0,w}$ = 78 dB). The value should not be used for lightweight floor constructions.

5 References to the ISO standards

ISO 10140-3:2022 (E) Acoustics – Laboratory measurement of sound insulation of building elements – Part 3: Measurement of impact sound insulation

ISO 717-2:2020 (E) Acoustics – Rating of sound insulation of building elements - Part 2: Impact sound insulation

ISO 3382-2:2008 (E) Acoustics – Measurement of room acoustic parameters - Part 2: Reverberation time in ordinary rooms

ISO 12999-1:2014 (E) Acoustics – Determination and application of measurement uncertainties in building acoustics – Part 1: Sound insulation.