AVSHOP AS

Acoustic measurement report

Music studio Kolbotn

Airborne sound insulation from the studio to the exercise room

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Measurement company: AVshop AS
Measurement date: 21 September 2026
Report date: 22 September 2026

The music studio in Kolbotn, fitted out for recording and editing.

Contents

1 Summary and main results

Music studio Kolbotn was designed for recording drums, guitar and vocals, as well as editing. The measurements and the customer's experience indicate very low sound transmission to the floor above. The investigated transmission path from the studio to the exercise room gives a reported R′w = 74 dB. The noise floor limits how much of this high sound insulation can be quantified.

Parameter	Result	Basis
R′w (C; Ctr)	74 (−2; −8) dB	Field Airborne and Excel
R′w + C50−5000	65 dB	74 − 9 dB; extended frequency range
Source measurements	Positions 1–4 only	Verified against the Excel export
Living room above	Qualitative observation	Insufficient level above the noise floor

Class A benchmark: The reported R′w + C50–5000 = 65 dB is 3 dB above the 62 dB Class A limit for airborne sound insulation between dwellings in NS 8175:2019. The limit is used here as a reference for the studio-to-exercise-room transmission path, with the measurement qualifications at 50–80 Hz and for background variation. The comparison is explained on page 8.

The main result uses source positions 1–4; corner position 5 is excluded. Fourteen of 21 frequency bands are marked as measurement limits. With stable, representative background noise, the noise-floor limitation is conservative: background noise can make transmission appear higher and sound insulation lower than they actually are. It therefore provides no artificial benefit to the rating. The recorded background variation is considered separately on page 7.

The customer reports that recording and editing can take place, at times at very high sound levels, without noticeable noise in the living room. No overall sound class has been assigned, and impact sound performance has not been measured for the studio.

2 The rooms and construction

The sound insulation was designed by AVshop AS, civil engineer Eivind Lygren, and installed by Slazak Multibyggtjenester. The contractor has also carried out larger and smaller projects for AVshop's customers.

Walls and ceiling

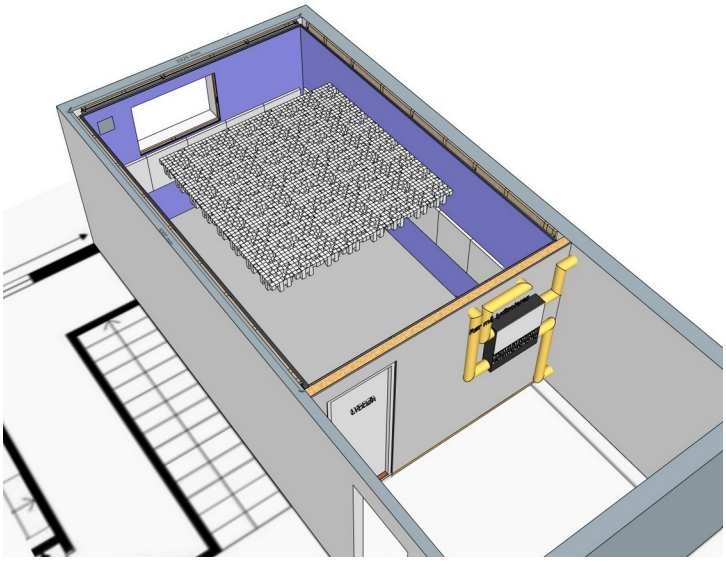
The walls and ceiling have two layers of gypsum fibreboard with damping compound between them. The lining is decoupled from the load-bearing structure using ProSilence Clips.

Floor

The floor is decoupled using ProSilence U-boats and consists of chipboard flooring, damping compound and one layer of gypsum fibreboard. The measurement documents the overall airborne sound insulation between the rooms; the floor's impact sound performance has not been measured separately.

Door and ventilation

The studio has a Daloc S30 steel door with a stated sound rating of 50 dB. Ventilation is provided by ProSilence CineVent 150, installed in an adjacent service room. Sound-absorbing ducts are routed with several bends and insulated. The door rating is a stated product property and must not be confused with the field result between the studio and exercise room.



Design illustration of the studio and adjacent space. The drawing illustrates the solution and does not verify concealed construction work.

3 Airborne sound measurement from studio to exercise room

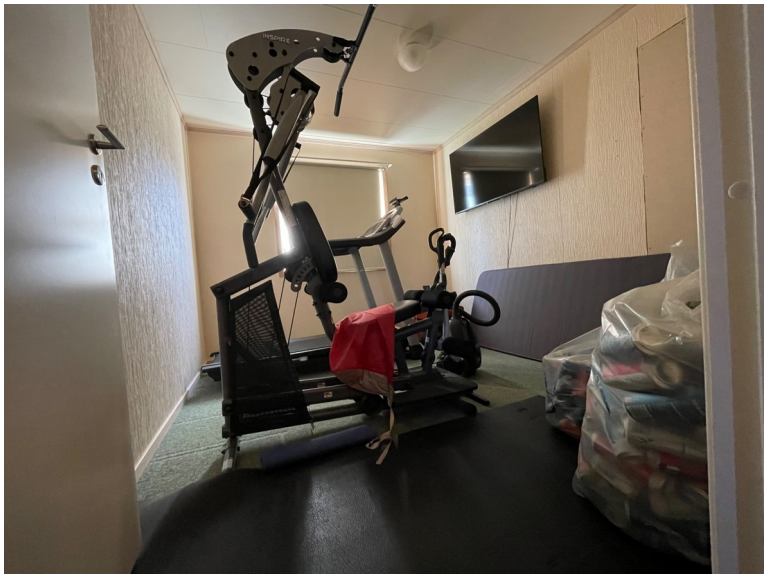
Measurement sequence and choice of rooms

The living room was investigated first. It extends approximately 2.5 m over the studio. Sound transmission was so low that a sufficient level above the low noise floor could not be achieved for a quantified insulation measurement. No R′w or DnT,w value is therefore stated for the living room.

Measurements were then taken in the exercise room, which is directly above the studio. The rooms share approximately 3.3 × 3.0 m of the separating floor. Receiving levels were also low here, and several bands were limited by background noise.

Measurement parameter	Value
Source room	Music studio, volume 34.8 m³
Receiving room	Exercise room, volume 23.8 m³
Common separating area	9.90 m², approximately 3.3 × 3.0 m
Frequency range	1/3-octave bands from 50 to 5000 Hz
Exported measurement setup	Norsonic ISO 16283-1 Normal; rating ISO 717-1
Recorded level measurements	4 source positions, 4 receiving positions and 4 background positions

Source positions 1–4 were measured at the studio's 25% positions, and the exported room average has been checked against them. A planned, separate corner survey of bass build-up and low-frequency sound transmission could not be completed because of the bass traps. Only corner position 5 was measured. It is excluded from the main measurement basis; the incomplete supplementary survey does not change the results from positions 1–4.

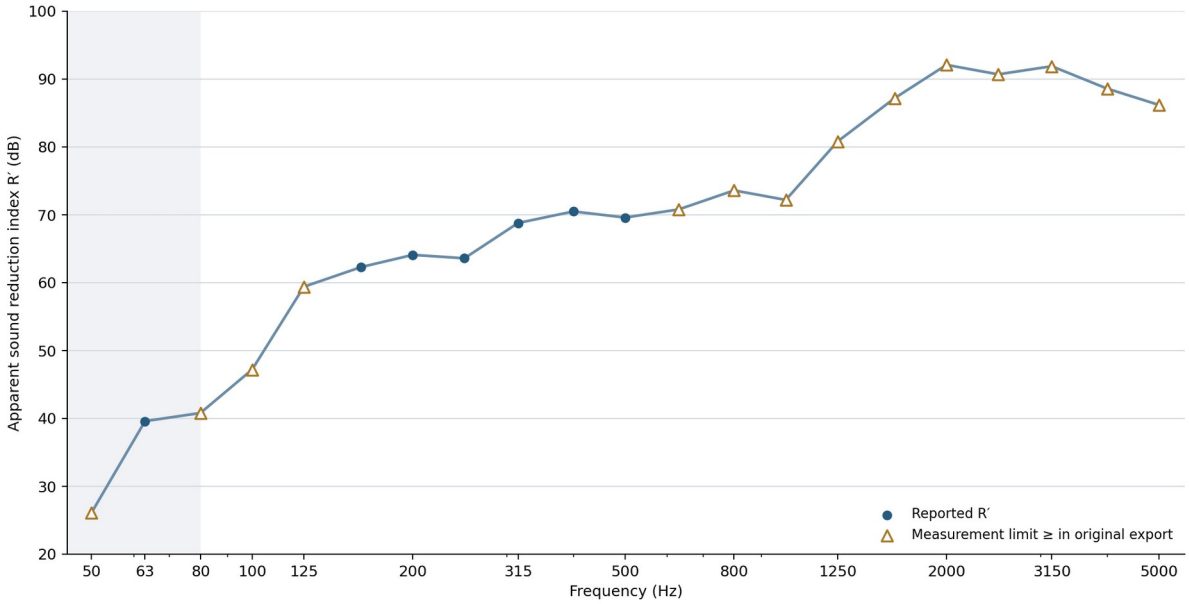


The exercise room on the floor above, used as the receiving room for the quantified measurement.

Airborne sound insulation results

Quantity	Value	Interpretation
R′w (C; Ctr)	74 (−2; −8) dB	Reported weighted field result, 100–3150 Hz
R′w + C	72 dB	Spectrum-adapted value
R′w + Ctr	66 dB	Spectrum-adapted value with greater bass weighting
C50–3150 / C50–5000	−10 / −9 dB	Adaptation terms including bands down to 50 Hz
R′w + C50–5000	65 dB	Extended value with a methodological qualification at 50–80 Hz

The result is taken from the Field Airborne report and the matching Excel export. R′w describes this field measurement, which includes both direct transmission and any flanking contributions. The value is not a laboratory rating for ProSilence Clips or for any single building element.



Frequency curve from the main export. Triangles indicate bands marked ≥ in the Norsonic report. The shaded area indicates 50–80 Hz, where a specific methodological limitation applies.

The reported values in the 200–500 Hz bands range from 63.6 to 70.5 dB. All bands above 500 Hz are marked as measurement limits. With stable, representative background noise, this means the noise floor may conceal even better insulation; it does not artificially improve the rating. The limits and background variation are explained on pages 6–7.

The separate Multi Rating report gives R′w = 73 dB and DnT,w = 72 dB, but contains different frequency data. It has not been combined with the main result. The discrepancy between sources and the DnT check are explained in Appendix B.

Frequency data and measurement limitations

Frequency Hz	R′ dB	L2sb − Lb dB	Export status
50	≥ 26.1	1.3	Measurement limit
63	39.6	8.4	Corrected
80	≥ 40.8	5.1	Measurement limit
100	≥ 47.2	2.3	Measurement limit
125	≥ 59.4	3.9	Measurement limit
160	62.3	8.0	Corrected
200	64.1	14.0	No flag
250	63.6	16.1	No flag
315	68.8	12.1	No flag
400	70.5	11.4	No flag
500	69.6	9.5	Corrected
630	≥ 70.8	2.4	Measurement limit
800	≥ 73.6	5.8	Measurement limit
1000	≥ 72.2	3.3	Measurement limit
1250	≥ 80.8	-9.9	Measurement limit
1600	≥ 87.2	-10.7	Measurement limit
2000	≥ 92.1	-11.9	Measurement limit
2500	≥ 90.7	-11.1	Measurement limit
3150	≥ 91.9	-10.1	Measurement limit
4000	≥ 88.6	-7.7	Measurement limit
5000	≥ 86.2	-6.1	Measurement limit

L2sb = receiving level with the sound source on, including background noise. Lb = separately measured background level. Values are taken from Excel and rounded to one decimal place.

Fourteen of 21 bands are marked as measurement limits, three are background-corrected and four have no such flags. The symbol ≥ means “greater than or equal to” and identifies the export’s lower limit for insulation in a noise-floor-limited measurement. With stable, representative background noise, the actual insulation may be better. The symbol does not indicate a precisely determined upper performance level.

At 1250–5000 Hz, the separately measured background level is higher than the level with the sound source on. This indicates background variation and must be considered separately from the conservative noise-floor limitation. An explanation and numerical example follow on the next page. The background data have not been changed or reselected.

The noise floor can conceal even better sound insulation

When the sound transmitted through the construction is very weak, background noise can dominate the receiving level. The limited correction then leaves some background noise as apparent transmitted sound. The receiving level is too high, and the calculated sound insulation is too low. With stable, representative background noise, this effect is conservative: the noise floor may conceal better actual performance, but does not artificially improve the rating.

How background noise is handled

ISO 16283-1 distinguishes between the receiving level with the source on, including background noise (L2sb), and the separately measured background (Lb). When the difference is no more than 6 dB, the background correction is limited to 1.3 dB and the result is marked as a measurement limit. This prevents uncertain subtraction of background noise from producing an unrealistically high insulation value. Between 6 and 10 dB, the level is corrected by energy subtraction.

Example with 25 dB background and 20 dB transmitted sound

In one frequency band, 25 dB of background noise and 20 dB of actual transmitted sound produce a combined measured level of approximately 26.2 dB. With the correction limited to 1.3 dB, the receiving level used in the calculation is approximately 24.9 dB. This is 4.9 dB higher than the actual transmitted level of 20 dB. The calculated insulation in this band is therefore approximately 4.9 dB worse than it actually is. This example illustrates the principle; it is not a recalculation of the Kolbotn result.

What a larger signal margin would mean

With the construction unchanged and all other measurement conditions equal and stable, greater separation between the test sound and the noise floor would allow the insulation to be determined more precisely. Removing this noise-floor limitation does not reduce the result. R′w may increase or remain unchanged because the single-number rating also depends on other frequency bands. A difference of 4.9 dB in one band therefore does not automatically mean a 4.9 dB increase in R′w.

Background variation is a separate issue

In this dataset, the separately measured background level is 6.1–11.9 dB higher than the source-on level at 1250–5000 Hz. The background was therefore not unchanged between recordings. This limits the certainty with which the limit values can be interpreted in these bands. It is a different issue from a stable noise floor masking weak transmission. R′w = 74 dB is retained as the reported field result with the stated methodological qualifications; it cannot unconditionally be described as a guaranteed minimum. Measurements with stable background noise and a better signal margin could establish the actual performance more precisely.

4 Overall assessment

The complete solution, with decoupled walls, ceiling and floor, an acoustic door and attenuated ventilation, provides very low sound transmission to the rooms above. The result applies to the completed installation and the measured transmission path; the measurement does not isolate the contribution of each individual product.

The customer is very satisfied and reports that the studio can be used for full recording and editing without noticeable noise in the living room, at times even at very high sound levels. This experience supports the assessment that the solution works well for its intended purpose. It is user experience, rather than a quantified guarantee for all sound levels and frequencies.

Airborne sound insulation compared with Norwegian Class A

NS 8175:2019 sets R′w + C50–5000 ≥ 62 dB as the Class A limit for airborne sound insulation between dwellings. Kolbotn's reported value of 65 dB is 3 dB above this limit. Class A is the standard's highest sound class. The measured path is from the studio to the exercise room within one dwelling; the between-dwellings criterion is used here as a benchmark.

The comparison includes 50–80 Hz and retains the methodological qualification for these bands: the receiving-room low-frequency procedure is not fully documented. Measurement limits and background variation also apply; see pages 6–7. R′w = 74 dB covers 100–3150 Hz; missing corner data at 50–80 Hz do not change that calculation. This airborne comparison does not assign an overall sound class to the studio or building; impact sound was not measured. STC or other US classifications have not been calculated.

5 Comments and recommendations

The measurement basis comprises four ordinary source positions and four receiving positions. The profile name ISO 16283-1 Normal in the export does not, by itself, document compliance with all requirements for source positions, microphone placement and measurement procedures. This report presents the exported calculation results with the stated methodological limitations.

For more precise documentation at 50–80 Hz, the 23.8 m³ exercise room should be measured using the low-frequency procedure for rooms below 25 m³. This differs from the planned supplementary survey in the studio's corners. The studio is 34.8 m³; one corner position there does not replace receiving-room corner measurements. A new check should ensure stable background noise and an adequate signal margin. Corner measurements alone do not provide a basis for predicting a higher insulation value.

6 Conclusion

Music studio Kolbotn shows very high reported airborne sound insulation, R′w = 74 (−2; −8) dB, based on source positions 1–4. With the qualifications above, the reported R′w + C50–5000 = 65 dB is 3 dB above the Class A benchmark for airborne sound insulation between dwellings. The noise-floor limitation is conservative with stable, representative background noise and may conceal better insulation; background variation creates a separate qualification on precision. The living room could not be quantified, but observations and the customer's experience indicate very low perceived sound transmission during studio use.

AVSHOP AS

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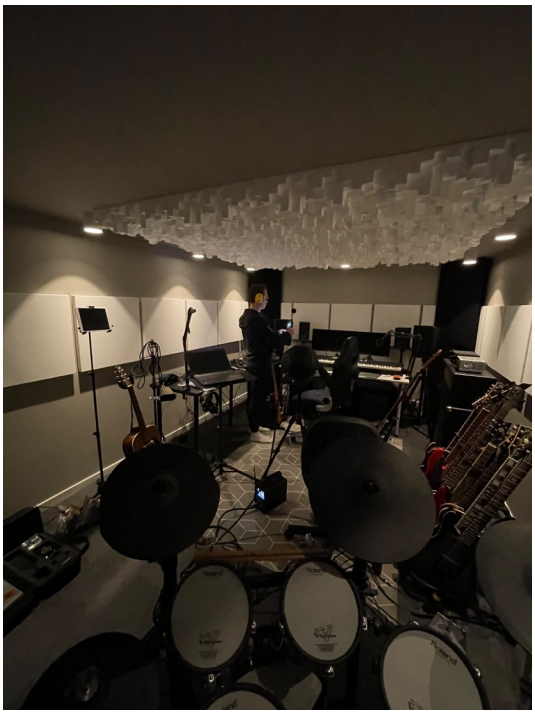
Appendix A Photographic documentation



Left: the studio with drum kit. Right: measurement work in the studio.

The studio interior, with recording and editing workspace, instruments and room acoustic treatment.

Appendix B Measurement basis and source verification

Verification of source positions and the corner measurement

The Excel sheet Measurement contains only source positions 1–4, recorded at 13:22:39, 13:23:14, 13:23:45 and 13:24:17. The averaging count is 4 in every frequency band. An independent energy-average calculation of these positions reproduces the exported L1 in all 21 bands after rounding to 0.1 dB.

Position 5 was taken as part of a separate supplementary survey of bass build-up and low-frequency transmission in the studio's corners. Bass traps prevented measurements at the remaining positions. This incomplete survey does not change the ordinary measurements at the 25% positions 1–4. Position 5 is excluded from the main basis and is not available as a separate numerical series in the attachments. One source-room corner does not replace the receiving-room low-frequency procedure and cannot, on its own, be used to calculate a higher insulation value.

Comparison of the exports

Source	Result	Use in this report
Field Airborne PDF and Excel	R′w = 74 (−2; −8) dB	Main basis, source positions 1–4
Multi Rating PDF	R′w = 73 (−1; −6) dB DnT,w = 72 (−1; −6) dB	Separate export with different frequency data
Recalculation from Excel	DnT,w ≈ 73 dB	Check value from rounded data, not an original exported value

The DnT check uses T0 = 0.5 s, V = 23.8 m³ and S = 9.90 m². This gives DnT ≈ R′ − 1.139 dB. The single-number rating is close to a rounding threshold. The reason for the difference between the PDF exports is undocumented and cannot be attributed to corner position 5 on the basis of the attachments.

Background noise and equipment

The background measurement at 14:22:11 is 34.8 dBA; the other three are 19.5–20.2 dBA. All four are included in the exported energy average of 29.2 dBA. The first recording has not been removed without documentation of what caused the difference. At 50 Hz, recorded reverberation time also varies substantially, from 0.68 to 3.07 s.

The export identifies a Norsonic Nor145, Nor1239 microphone and Nor1209 preamplifier. Complete instrument identification and calibration traceability are not provided in the export and are therefore not certified in this report.

Sources

Measurement attachments: WINTHER TRIMROM, Excel at 15.55.54; Field Airborne PDF at 15.52.21; Multi Rating PDF at 15.48.43, all dated 21 September 2026. Copies marked (1) and (2) are identical. Construction and use descriptions follow the project information supplied by AVshop.

Standards Norway · NS 8175:2019, scope and sound classes

Brüel & Kjær · Building Acoustics Software, section 4.6 on low-frequency measurement

ISO methods and definitions · Jens Holger Rindel, Noise News International

ISO 16283-1:2014, section 9 · Background noise correction

Norsonic · Airborne sound insulation, background noise and measurement limits

Boligprodusentene · Lars Myhre, Nytt om teknisk, 30 October 2019, PDF page 4, between-dwellings limit

Appendix C Original Norsonic Field Airborne report

Apparent sound reduction index according to ISO 16283-1

Field measurements of airborne sound insulation between rooms

Client: AVshop
Description: Måling av Prosilence hos Winther
Date of test: 21.09.2026

Object:

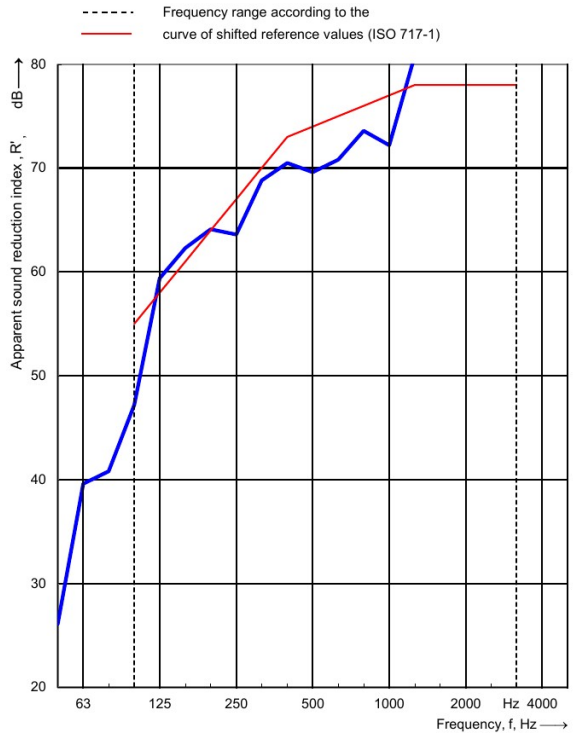
Source room:
Condition:
Type:
Location:

Receiving room:
Condition:
Type:
Location:

Area of common partition: 9,90 m²
Source room volume: 35 m³
Receiving room volume: 24 m³

Frequency f [Hz]	R' 1/3 octave [dB]
50	≥ 26,1
63	39,6
80	≥ 40,8
100	≥ 47,2
125	≥ 59,4
160	62,3
200	64,1
250	63,6
315	68,8
400	70,5
500	69,6
630	≥ 70,8
800	≥ 73,6
1000	≥ 72,2
1250	≥ 80,8
1600	≥ 87,2
2000	≥ 92,1
2500	≥ 90,7
3150	≥ 91,9
4000	≥ 88,6
5000	≥ 86,2

Limit of measurement



Rating according to ISO 717-1

R'_w $(C;C_{tr})$ = 74 (-2 ; -8) dB

$C_{50\text{-}3150}$ = -10 dB $C_{50\text{-}5000}$ = -9 dB $C_{100\text{-}5000}$ = -1 dB

$C_{tr,50\text{-}3150}$ = -24 dB $C_{tr,50\text{-}5000}$ = -24 dB $C_{tr,100\text{-}5000}$ = -8 dB

Evaluation based on field measurement results obtained in one-third-octave bands by an engineering method.

Name of test institute:
No. of test report:

Date: 21.09.2026
Signature: