



Institut pro testování a certifikaci, a.s. (Institute for Testing and Certification)
CSI Division – Centre of Civil Engineering, branch
Zlín, K Cihelně 304, 764 32 Zlín-Louky
Testing laboratory for physical properties of materials, constructions and buildings – Zlín

Testing laboratory No. 1007.1, accredited by ČIA (Czech Accreditation Institute) according to ČSN EN ISO/IEC 17025:2018



Test Report no. 381/19

Laboratory measurement of airborne sound insulation according to ČSN EN ISO 10140-2

Subject of the test: NOVATOP SOLID 84 wall between flats

Order number: 963 389

Number of pages:6
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Ordering party: **University of Technology in Brno, Faculty of Civil Engineering**
Veveří 331/95
602 00 Brno

Sample receipt date: December 13, 2019

Date of test examination: December 17, 2019

The test was performed by the acoustics laboratory

Technical head of the laboratory: Ing. Miroslav Figalla

Manager of testing laboratory no. 1007.1:

Ing. Petra Hrdinová

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On: December 18, 2019



1. Ordering of the test

The test was performed on the basis of order no. 3591208856 dated December 3, 2019, in the premises of laboratory no. 1007.1, K Cihelně 304, 764 32 Zlín-Louky.

2. Subject of the test

Determination of airborne sound insulation by laboratory method according to ČSN EN ISO 10140-2.

Element tested: Novatop Solid 84 wall between rooms, dimensions: 3,560 x 2,840 mm. Manufacturer: AGROP NOVA a.s., Ptenský Dvorek 99, 798 43 Ptení. The technical description supplied by the ordering party is specified on p. 5. The data on the sample determined by the laboratory are shown on the standard measurement record, on page 4; photo documentation of the sample is found on page 6. The testing laboratory is not responsible for the correctness of technical data and information about the sample tested supplied by the ordering party.

3. Test sample

The ordering party delivered the test sample on December 13, 2019. The wall was installed in the measuring opening for vertical elements. The perimeter joints were sealed with textile rope, rubber profiles and acrylic putty. The wall was assembled by the laboratory together with the manufacturer's and the ordering party's employees.

4. Regulations and measuring technique applied

4.1 Regulations

- ČSN EN ISO 10140-2 Acoustics – Laboratory measurement of sound insulation of building structures. Part 2: Measurement of airborne sound insulation,
- ČSN EN ISO 10140-1 Acoustics – Laboratory measurement of sound insulation of building structures. Part 1: Application rules for certain products,
- ČSN EN ISO 10140-4 Acoustics – Laboratory measurement of sound insulation of building structures. Part 4: Measurement procedures and requirements,
- ČSN EN ISO 717-1 Acoustics – Evaluation of sound insulation properties of buildings and building structures. Airborne sound insulation of buildings and building structures.

Related Standards:

- ČSN EN 10140-5 Acoustics – Evaluation of sound insulation properties of buildings a building structures. Requirements for test equipment and instrumentation.
- ČSN EN ISO 12999-1 Acoustics – Determination and use of measurement uncertainties in building acoustics – Part 1: Sound insulation.

4.2 Devices

- | | |
|--------------------------------|-----------|
| - Norsonic RTA 840 analyzer | M 07 2024 |
| - B.K. measuring microphone | M 07 2005 |
| - AM-39 amplifier | I 05160 |
| - omnidirectional sound source | I 52346 |

5. Test procedure

The measurement is performed in sound chambers that meet the requirements of ČSN EN ISO 10140-5. The test sample is installed between the source room and the reception room, in the measuring opening for vertical elements. A steady sound with a continuous spectrum in the range from 100 to 5,000 Hz is generated in the source room. The mean sound pressure levels (in dB) in both rooms are measured. Sound insulation R is determined by the following relation:

$$R = L_1 - L_2 + 10 \log \frac{S}{A} \quad (\text{dB}),$$

where L_1 is the mean sound pressure level in the source room,
 L_2 .. is the average sound pressure level in the reception room,
 S ... is the area of the sample tested in m^2 ,
 A ... is the equivalent absorbing surface in the reception room in m^2 .

The size of the equivalent absorbing surface is determined from the reverberation time measured in accordance with ČSN ISO 3382-2 using Sabine equation:

$$A = \frac{0,16 V}{T}$$

where V is the volume of the reception room in m^3 ,
 T ... is the reverberation time in the reception room in seconds.

From the values of sound insulation R in the one-third octave bands of 100 to 3,150 Hz, a single-number value – weighted sound insulation R_w and spectrum adjustment factors C , C_{tr} – is determined using a directional curve based on the procedure according to ČSN EN ISO 717-1.

6. Measurement results

Registration number	Sample description	Weighted sound insulation $R_w(C; C_{tr})$ (dB)
273/19	NOVATOP SOLID 84 wall between flats	60 (-2; -5)

The course of sound insulation as a function of frequency and other measurement data are shown in the standard measurement record on p. 4.

7. Measurement uncertainty

The measurement uncertainty is expressed according to ČSN EN ISO 12999-1 using the standard deviation of reproducibility. Measurement results, including uncertainty:

$$R_w = (60.2 \pm 2.4) \text{ dB}$$

$$R_w + C = (58.4 \pm 2.6) \text{ dB}$$

$$R_w + C_{tr} = (55.1 \pm 3.0) \text{ dB}.$$

The values are determined for the expansion factor $k = 2$, which corresponds to a confidence level of 95% for a two-sided interval.

The person who produced the Report and who is responsible for the test: Ing. Miroslav Figalla

Airborne sound insulation according to ČSN EN ISO 10140-2

Registration number:

Laboratory measurement of airborne sound insulation of building structures

Ordering party:
University of Technology in Brno,
Faculty of Civil Engineering
Veveří 331/95
602 00 Brno

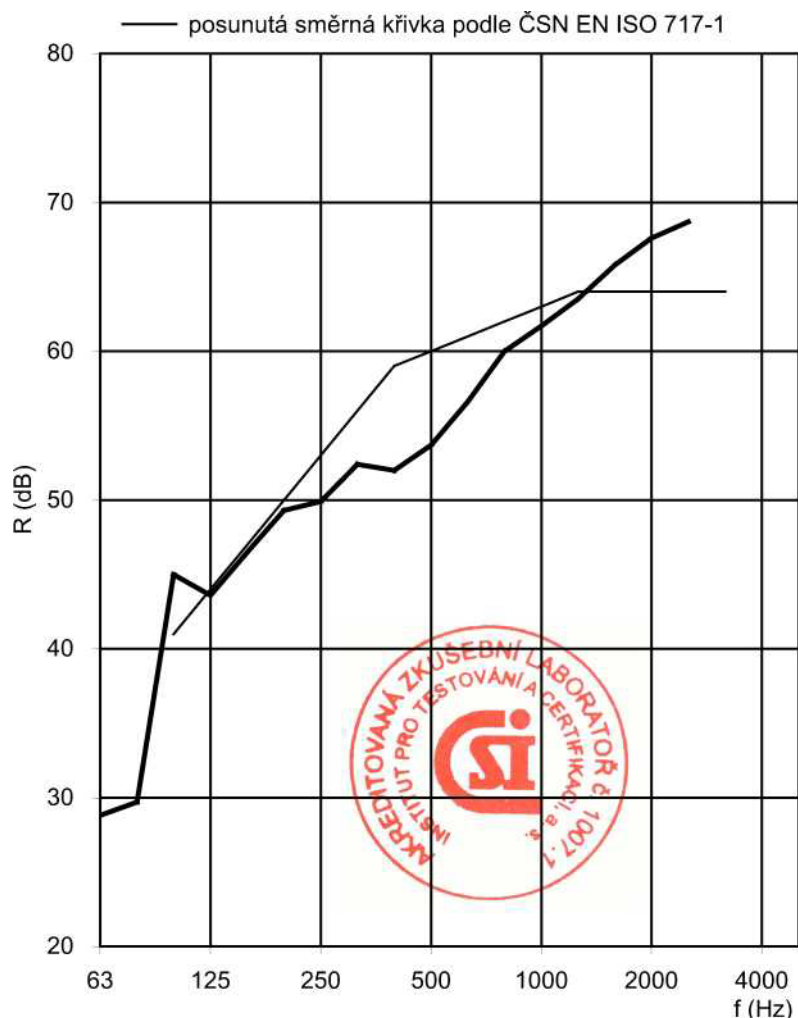
Product: NOVATOP SOLID 84 wall
between flats

Composition of the sample: 2x gypsum plasterboard, a thickness of 12.5 mm, a grid made of CW profiles fixed in the lower and upper parts of the wall with anchoring L profiles, acoustic insulation filling: glass wool, a thickness 60 mm, contact flexible seal, NOVATOP Solid 84 mm panel, contact flexible seal, a grid made of CW profiles fixed in the lower and upper parts of the wall with anchoring L profiles, acoustic insulation filling: glass wool, a thickness 60 mm, gypsum plasterboard, a thickness of 12.5 mm. Sample dimensions: 3,560 mm x 2,840 mm, thickness of 280 mm, surface weight: 79 kg/m².
Sample number: 154-3/A/19.

Freq. (Hz)	R 1/3 oct. (dB)
50	23.3
63	28.8
80	29.7
100	45.0
125	43.6
160	46.5
200	49.3
250	49.9
315	52.4
400	52.0
500	53.7
630	56.6
800	60.0
1,000	61.7
1,250	63.5
1,600	65.8
2,000	67.6
2,500	68.7
3,150	>68.6
4,000	>67.4
5,000	>65.3

Evaluation according to EN ISO 717-1
R_w (C;) = 60 (-2; -5) dB

C₅₀₋₃₁₅₀ = -4 dB, C_{tr,50-3150} = -15 dB
C₅₀₋₅₀₀₀ = -4 dB, C_{tr,50-5000} = -15 dB
C₁₀₀₋₅₀₀₀ = -1 dB, C_{tr,100-5000} = -5 dB



Test conditions

Test area: 10.3 m²
Source room volume: 90 m³
Volume of the reception: 70 m³

Test date:

December
Air temperature: 18 °C
Relative humidity: 51 %
Atmospheric: 982 hPa



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Ing. Miroslav Figalla
Technical head of the

Date: December 18, 2019

COMPOSITION DESCRIPTION:

The main material of the manufacturer is: panels (boards made of cross-laminated solid wood). SOLID panels are manufactured from spruce lamellas put together in layers and glued in all directions. The number of layers can differ and determines the final thickness of the panel. The timber for the production is dried to the moisture of approximately 8%.

NOVATOP products used:

- Solid 84 – 2x SWP 42

The size of the test wall is 3.56 m x 2.85 m.

Composition No. 4: Wall between flats

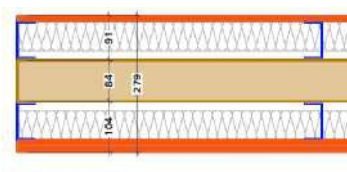
1. RIGIPS Gypsum plasterboard, fire protection marking: RF (DF), a thickness of 12.5 mm.
2. RIGIPS Gypsum plasterboard, fire protection marking: RF (DF), a thickness of 12.5 mm.
3. RIGIPS grid made of CW profiles anchored only at the bottom and top of the wall by anchoring L profiles flexibly separated from NOVATOP Solid 84. The contact of the grid with NOVATOP Solid is secured by contact seal. Thickness of 75 mm + 3-5 mm flexible seal.

Acoustic insulation between the profiles: Isover PIANO 60 mm.

4. NOVATOP SOLID 84 mm
5. RIGIPS grid made of CW profiles anchored only at the bottom and top of the wall by anchoring L profiles flexibly separated from NOVATOP Solid 84. The contact of the grid with NOVATOP Solid is secured by contact seal. Thickness of 75 mm + 3-5 mm flexible seal.

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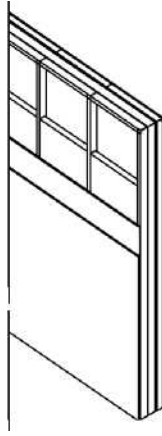


Photo documentation of the test
sample



End of report