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. 080/20

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

Subject of the test: double wall between flats, visual on both sides NOVATOP SOLID 84

Order number: 963 389

Number of pages:6
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Ordering party: **AGROP NOVA a.s**
Ptenský Dvorek 99
798 43 Ptení

Sample receipt date: March 10, 2020
Date of test examination: March 11, 2020
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

On: March 30, 2020

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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 double wall between flats, visual on both sides, dimensions: 3,560 x 2,850 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 March 10, 2020. 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 installed by the ordering party together with the laboratory staff.

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:

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

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 X 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)**
28/20	NOVATOP SOLID 84 double wall between flats, visual on both sides	**58 (-1; -4)**

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 = (58.7 ± 2.4) dB
R_w + C = (56.8 ± 2.6) dB
$R_w + C_{tr}$ = (53.8 ± 3.0) 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:
AGROP NOVA a.s
Ptenský Dvorek 99
798 43 Ptení

Product: NOVATOP SOLID 84 double wall between flats, visual on both sides

Composition of the sample: NOVATOP Solid 84 mm wooden panel, gypsum fibreboard – a thickness of 12.5 mm, mineral wool a thickness of
60 mm, gypsum fibreboard – a thickness of 12.5 mm, NOVATOP Solid 84 mm wooden panel.
Sample dimensions: 3,560 mm x 2,850 mm, thickness of 295 mm, surface weight: 114 kg/m^2.
Sample number: 12/A/20.

Freq. (Hz)	*R* 1/3 oct. (dB)
50	36.5
63	42.8
80	39.9
100	47.0
125	45.1
160	46.8
200	47.2
250	48.0
315	48.6
400	47.8
500	50.7
630	57.2
800	61.8
1,000	62.9
1,250	65.1
1,600	67.8
2,000	69.9
2,500	>70.9
3,150	>70.6
4,000	>68.5
5,000	>63.8
Evaluation according to EN ISO 717-1	
***R*w (*C*;**	**= 58 (-1; -4) dB**

$C_{50\text{-}3150}$ = -1 dB, $C_{tr,50\text{-}3150}$ = -6 dB
$C_{50\text{-}5000}$ = -1 dB, $C_{tr,50\text{-}5000}$ = -6 dB
$C_{100\text{-}5000}$ = 0 dB, $C_{tr,100\text{-}5000}$ = -4 dB

CSI Division – Centre of Civil Engineering

Ing. Miroslav Figalla
Technical head of the

Date: March 30, 2020

Test conditions		Test date:	March 11,
Test area:	10.3 m^2	Air temperature:	19 °C
Source room volume:	90 m^3	Relative humidity:	46%

Volume of the reception	70 m^3	Atmospheric	980 hPa

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 84mm – 2x SWP 42mm

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

NOVATOP SOLID 84 double wall between flats, visual on both sides

1. NOVATOP SOLID 84 mm
2. Fermacell 12.5 mm.
3. Isover AKU 60 mm.
4. Air gap 40 mm.
5. Fermacell 12.5 mm.
6. NOVATOP SOLID 84 mm

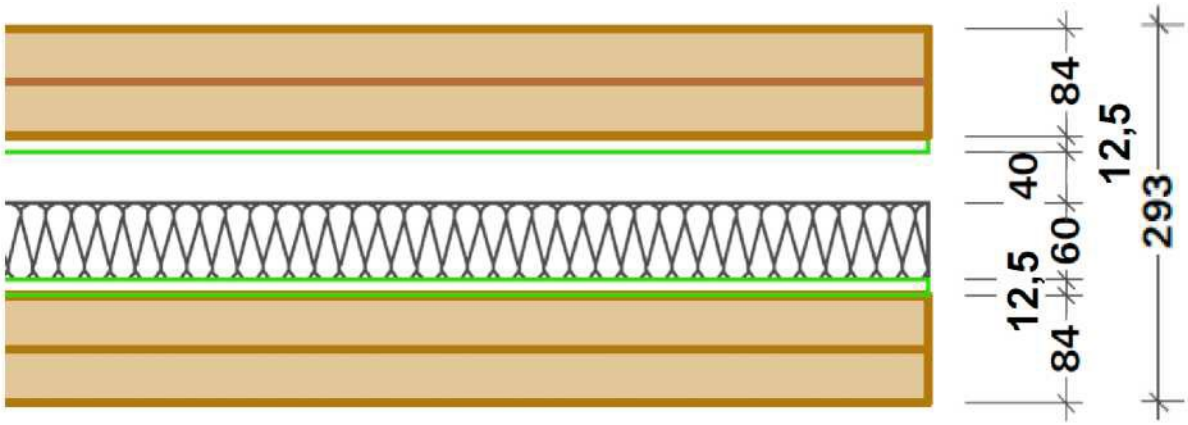
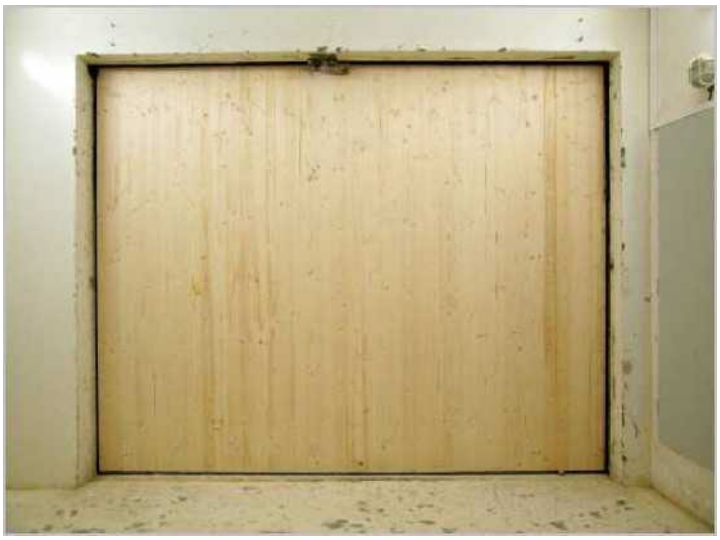


Photo documentation of the test sample



End of report.....