



TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.

Technical and Test Institute for Construction Prague

Akreditovaná zkušební laboratoř, Autorizovaná osoba, Notifikovaná osoba, Oznamovaný subjekt, Subjekt pro technické posuzování, Certifikační orgán, Inspekční orgán / Accredited Testing Laboratory, Authorised Body, Notified Body, Technical Assessment Body, Certification Body, Inspection Body.



L 1018.3

Central Laboratory – Teplice Testing Facility

Testing lab address: Tolstého 445, 415 03 Teplice

Phone: +420 602 115 450, e-mail: rubas@tzus.cz, www.tzus.eu

REPORT

Test Laboratories No. 1018.3

accredited according to ČSN EN ISO/IEC 17025:2018 by Český institut pro akreditaci, o.p.s. (the Czech Institute for Accreditation)

no. 040-066390

on test of the weighted sound absorption coefficient α_w according to ČSN EN ISO 354:2003

Customer: Vildika JSC
Address: Pakalnes st. 10, Bezdonys, LT-15201, Lithuania

Organisation reg. No.: 123633891

Manufacturer: Vildika JSC
Address: Pakalnes st. 10, Bezdonys, LT-15201, Lithuania

Test sample: Acoustic Table Screen

Job Order No.: Z040200472

Number of protocol pages including the front page: 5 Number of annexes/pages: 4/5

Prepared by:

Pavel Rubáš, Ph.D.
Test Technician – Specialist

Approved by:

Pavel Bartoš
Deputy Head of Testing Laboratory

Copy No.: 1
Number of copies: 3



Teplice, 7 January 2021

Declaration: 1) The test results presented in this protocol relate to the tested object only and do not replace any other documents.
2) This protocol may not be reproduced in any form other than in its entirety without the written consent of the Testing Laboratory.
3) The Laboratory bears no responsibility for the result if it might have been affected by the information provided by the client (marked * in the protocol).

Technický a zkušební ústav stavební Praha, s.p., Central Laboratory

Nemanická 441, 370 10 České Budějovice

Bank details: Komerční banka, Prague 1

Listed in the Commercial Register maintained by the Municipal Court in Prague, Section ALX, File 711, Company Identification No.: 00015679, VAT ID: CZ00015679

Tel: +420 387 023 211

Account No: 1501-931/0100

www.tzus.eu

e-mail: pilarova@tzus.cz

1. Sample data

Sample No.: VZ040203169
Sample: Acoustic Table Screen - test area 1600 x 650 mm => 10,5 m²
Order/contract: e-mail from 09.12.20
The sample was conditioned for more than 24 hours in the laboratory.
Date of purchase / delivery: 18 December 2020
Sampling site: The sample was supplied by the customer to the Teplice Testing Facility
Sampling method: ---
Sample preparation method: ČSN EN ISO 354 Acoustics - Measurement of sound absorption in a reverberation room
The measured structures or components for realization were supplied by the manufacturer. The sample was visually inspected upon acceptance and its type checked according to the specification. The sample composition was found to correspond to the submitted description. Assembly was performed by the personnel of TZÚS, s. p. – Teplice branch. Data on sample composition were taken from the specification provided by the manufacturer. The weights and other parameters are for information, control, and documentation purposes only.

The test results apply to the sample as received.

2. Testing methods

ČSN EN ISO 354:2003 Acoustics - Measurement of sound absorption in a reverberation room
Supplementation, deviations or exclusions from the standard procedure or application of non-standard methods: not applied
Simultaneously the following referenced standards focused on evaluation were applied.
ČSN EN ISO 11654:1998 Acoustics - Sound absorbers for use in buildings - Rating of sound absorption
VDI 3755:2015-01 Sound insulation and absorption

3. Test results

Tests performed on: 07 January 2021
Testing location: Teplice Testing Facility
DOSO Reverberation Chamber
Testing officers: Pavel Rubáš, Ph.D. (Test Technician - Specialist)
Marie Hartlichová (Test Technician)

The details of the testing conditions and of the testing equipment used are given in the test records. The instrumentation and gauges are validated and calibrated as specified in the Teplice Testing Laboratory validation/calibration schedule.

3.2 Data Declared by Manufacturer

see Annex 3

3.3 Technical specification of the test

Measurement was done in an anechoic chamber according to ČSN EN ISO 354. Measurement is done by omnidirectional impact of the sound waves on the sample and is based on measurement of the reverberation time of the empty chamber and the chamber containing the tested sample. The



difference in measurements is used to specify the equivalent absorption area of the sample and the sound absorption coefficient α_s . The measurement was done in one third octave bands from 100 to 5000 Hz.

The results of the test are the values of sound absorption coefficient α_{si} in one third octave bands from 100 to 5000 Hz. The main result of testing that is objectively related to the tested structure is the main result of testing that is objectively related to the tested structure **is the single digit variable of the weighted sound absorption α_w** .

The average reverberation time in the reverberant chamber is determined by measurement with a test sample installed and without a test sample. The equivalent absorption area A_1 , in square metres, of an empty reverberant chamber is calculated using the formula:

$$A_1 = \frac{55,3V}{cT_1} - 4Vm_1$$

Where

- V is the volume of the empty reverberant chamber in cubic metres;
- c speed of sound transmission in the air in metres per second (for the usual laboratory temperatures in the range $t = 15^\circ\text{C}$ to 30°C , the value is calculated as $c = 331 + 0.6t$ (m/s);
- T_1 reverberation time, in seconds, of an empty reverberant chamber;
- m_1 attenuation coefficient in air, in m^{-1} , calculated according to ISO 9613-1 with respect to the climatic conditions that existed in the empty reverberant chamber during measurement.

The value of m_1 can be calculated from the damping factor α , which is used in ISO 9613-1, according to the formula:

$$m = \frac{\alpha}{10 \lg(e)}$$

The equivalent absorption area A_2 , in square metres, of the reverberant chamber containing a test sample is calculated using the formula:

$$A_2 = \frac{55,3V}{cT_2} - 4Vm_2$$

Where

V and c have the same meaning as in the previous paragraph;

T_2 reverberation time, in seconds, of the reverberant chamber after the test sample has been placed;

m_2 attenuation coefficient in air, in m^{-1} , calculated according to ISO 9613-1 with respect to the climatic conditions that existed in the reverberant chamber including the sample.

The equivalent absorption area A, in square metres, is calculated using the formula:

$$A_T = A_2 - A_1 = \frac{55,3V}{c} \left(\frac{1}{T_2} - \frac{1}{T_1} \right) - 4V(m_2 - m_1)$$



Where

- c_1 is the speed of sound propagation in air at temperature t_1 ;
 c_2 is the speed of sound propagation in air at temperature t_2 ;
 A_1 , V , T_1 , m_1 , A_2 , T_2 and m_2 have the same meanings as in the preceding paragraphs.

The sound absorption coefficient α of the sample is calculated using the formula:

$$\alpha_s = \frac{A_T}{S}$$

Where

- A_T is the equivalent absorption area A , in square metres
 S is the area covered by the test sample in square metres

3.4 Instruments and gauges used

Norsonic type 118 – Integration sound-level meter of accuracy 1 complying with EC 60651, 60804, 61672-1, and 61260, primary memory for 2,500,000 pieces of data. Serial number 32127, 8012-OL-10114-20, valid till: 08/03/2022

Norsonic type 118 – Integration sound-level meter of accuracy 1 complying with EC 60651, 60804, 61672-1, and 61260, primary memory for 2,500,000 pieces of data. Serial number 31991, 8012-OL-10112-20, valid till: 08/03/2022

Microphone Norsonic type 1225 and pre-amp type 1205, serial No. 92003, test sheet No. test sheet: 8012-OL-10115-20, valid till: 08/03/2022

Microphone Norsonic type 1225 and pre-amp type 1205, serial No. 72839, test sheet No. test sheet: 8012-OL-10113-20, valid till: 08/03/2022

Norsonic acoustic calibrator, type 1251, serial No.: 31612. This meter complies with the requirements of IEC 942, 8012-KL-10116-20, valid till: 08/03/2022

Combined thermometer, moisture meter and barometer Testo 622, serial No. 39507662/506, registration No. 431, Calibration data sheets: temperature No. 0778/16 valid till 29 February 2021, relative humidity No. 2016/3832 valid till 26 September 2021, atmospheric pressure No. 0395/2016 valid till 15 February 2021

Sound field excitation set, Norsonic hemisphere, type 250 (120 dB)



3.5 Determination of the weighted sound absorption coefficient, α_w according to ČSN EN ISO 354 and ČSN EN ISO 11654:1998

Performance	Units of measure	Class	Calculated value	
			Weighted sound absorption coefficient α_w Verbal description VDI 3755:2015-01	Extended measurement uncertainty
Determination of the weighted sound absorption coefficient, α_w VZ040203169 Acoustic Table Screen - test area 10,5 m ²	---	C	0.75 (H) high absorptive	± 0.10

The stated expanded measurement uncertainty is the product of the standard measurement uncertainty and the expansion coefficient $k=2$, which corresponds to about 95% coverage probability for normal distribution. The expanded measurement uncertainty was determined pursuant to ČSN EN ISO 12999-1:2015.



END OF REPORT

Sound absorption coefficient according to ČSN EN ISO 354

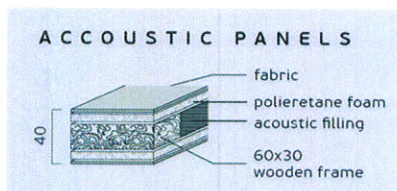
Measurement of sound absorption coefficient in a reverberation room

Client: Vildika JSC, Pakalnes st. 10, Bezdonys, LT-15201, Lithuania
Description: DOKO Teplice

Date of test: 07.01.2020

Object: VZ040203169
Table Screen

Acoustic

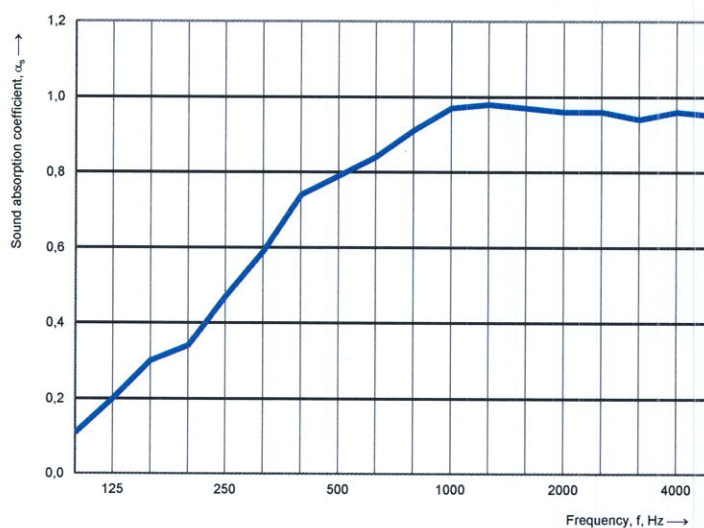


Surface area: 10,50 m²
Reverberation room volume: 206,2 m³

Empty reverberation room:
Relative humidity: 35,4 %
Temperature: 16,8 °C
Barometric Pressure: 986 kPa

Reverberation room with object:
Relative humidity: 37,9 %
Temperature: 16,5 °C
Barometric Pressure: 986 kPa

Frequency f [Hz]	α_s
100	0,11
125	0,20
160	0,30
200	0,34
250	0,47
315	0,59
400	0,74
500	0,79
630	0,84
800	0,91
1000	0,97
1250	0,98
1600	0,97
2000	0,96
2500	0,96
3150	0,94
4000	0,96
5000	0,95



No. of test report: Annex 1 to Report No. 040-066390



Sound absorption coefficient according to ČSN EN ISO 11654

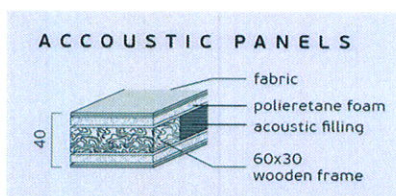
Measurement of sound absorption coefficient in a reverberation room

Client: Vildika JSC, Pakalnes st. 10, Bezdonys, LT-15201, Lithuania
#ODKAZ! DOKO Teplice

Date of test: 07.01.2020

#ODKAZ! VZ040203169
Table Screen

Acoustic

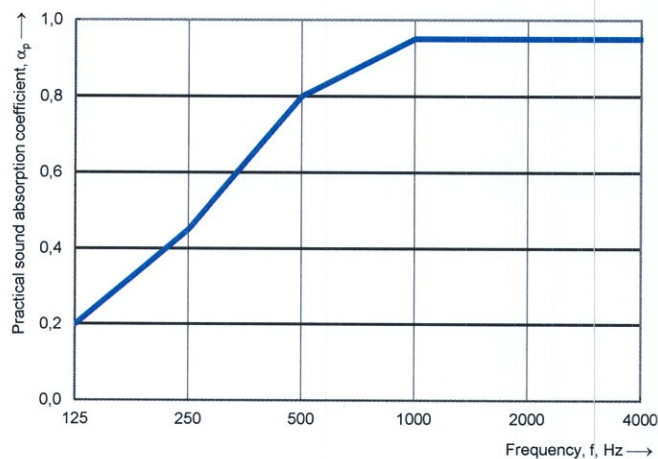


Surface area: 10,50 m²
Reverberation room volume: 206,2 m³

Empty reverberation room:
Relative humidity: 35,4 %
Temperature: 16,8 °C
Barometric Pressure: 986 kPa

Reverberation room with object:
Relative humidity: 37,9 %
Temperature: 16,5 °C
Barometric Pressure: 986 kPa

Frequency f [Hz]	α_p
125	0,20
250	0,45
500	0,80
1000	0,95
2000	0,95
4000	0,95



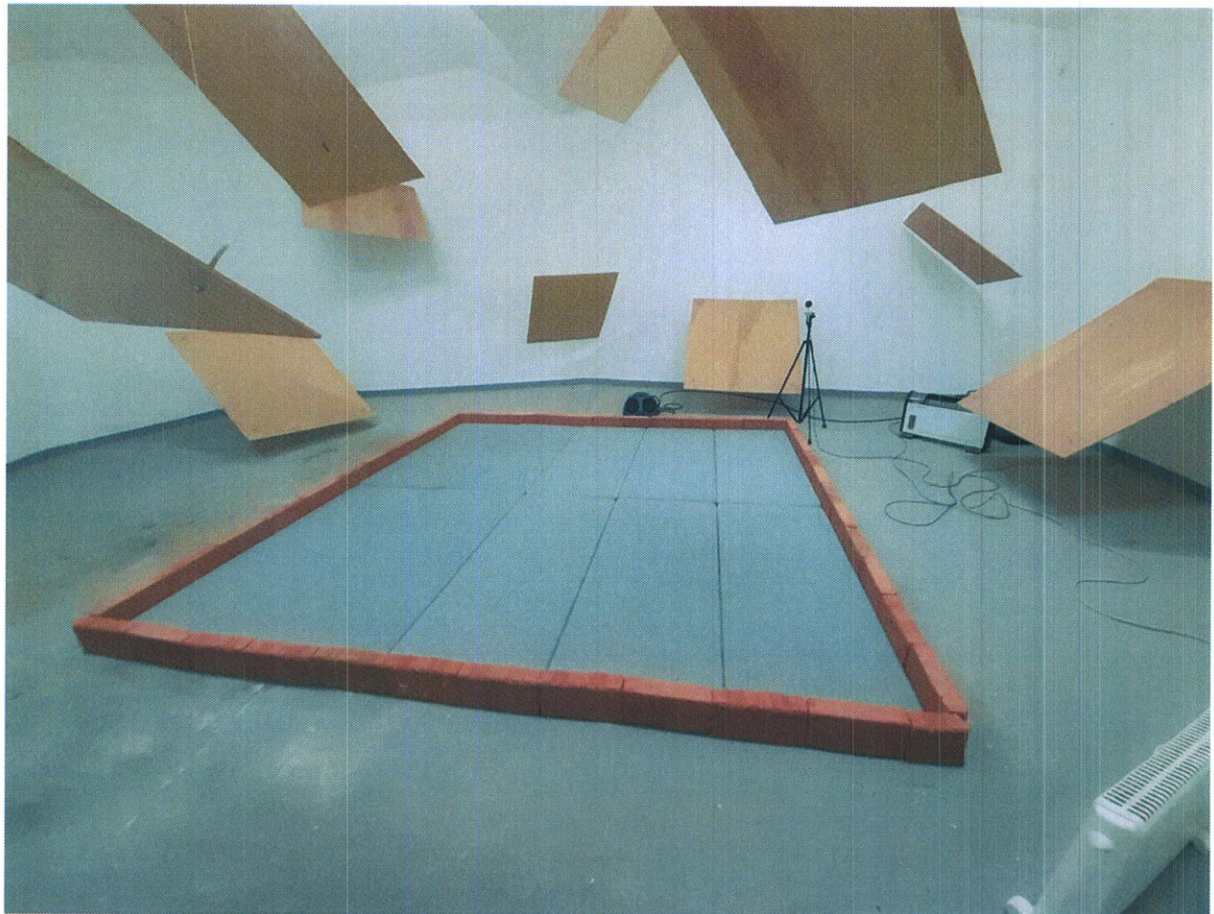
Weighted sound absorption coefficient according to ISO 11654
 $\alpha_w = 0,75$ (H)

No. of test report: Annex 2 to Report No. 040-066390

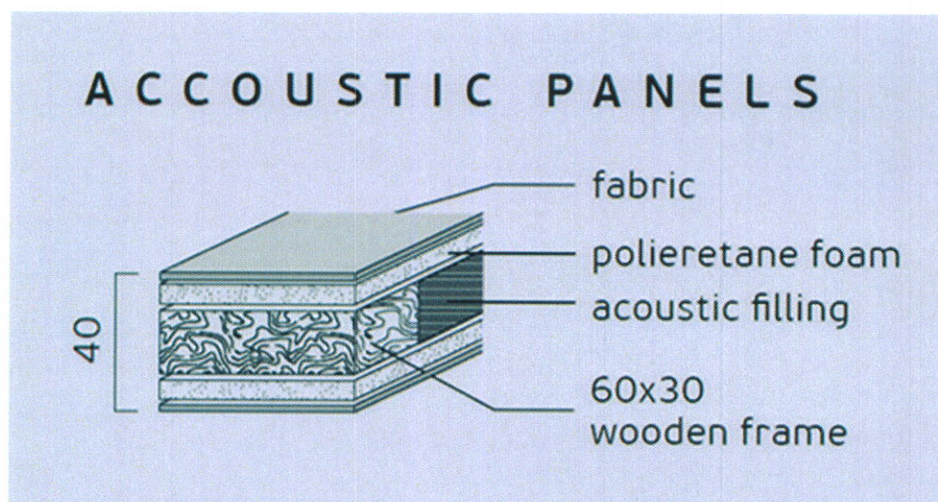


Photo documentation from laboratory measurements – sound absorption

Acoustic Table Screen, VZ040203169



Cut – Acoustic Table Screen, VZ040203169



Drawing – Acoustic Table Screen, VZ040203169

