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TEST

INSTITUT IGH, d.d.
Laboratorij za građevinsku fiziku
Building Physics Laboratory
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RN 62570888 Zagreb, 2021-10-11

TEST REPORT AND ASSESSMENT OF PERFORMANCE BASED ON TESTING No. EN-72570/100/21-209/21

(based on sampling carried out by the manufacturer)

Client:	SONITUS d.o.o., Tina Ujevića 26, HR-48000 Koprivnica
Offer::	Offer No. 72570-0-0398/19 dated on 2019-05-28
Building product:	absorber Sonitus Acoustics Decosorber Natur Twig
Manufacturer:	SONITUS d.o.o., Tina Ujevića 26, HR-48000 Koprivnica
Date of receipt of the sample:	2021-09-08
Laboratory sample No.:	LGF 228/21
Place of testing:	INSTITUT IGH, d.d., Materials and Structures Department, IGH Laboratory, Building Physics Laboratory, Janka Rakuše 1, HR-10000 Zagreb, Croatia
Tested property:	Sound absorption
Decision No.:	KLASA: UP/I-360-01/20-08/37, URBROJ: 531-04-2-1-2-21-10 dated on 2021-04-15

Responsible person: Head of the Building Physics Laboratory

Tomislav Vuić, univ. spec. aedif. dr. sc. Mladen Bezjak, dipl. ing. stroj.

Institut IGH d.d. is a notified body of the European Commission for the testing noise absorption of products used in civil engineering with the number: NB 2477 in the NANDO database.

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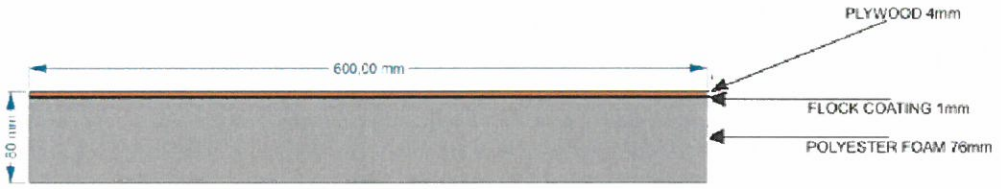
Task: Sound absorption testing of samples delivered by the manufacturer.

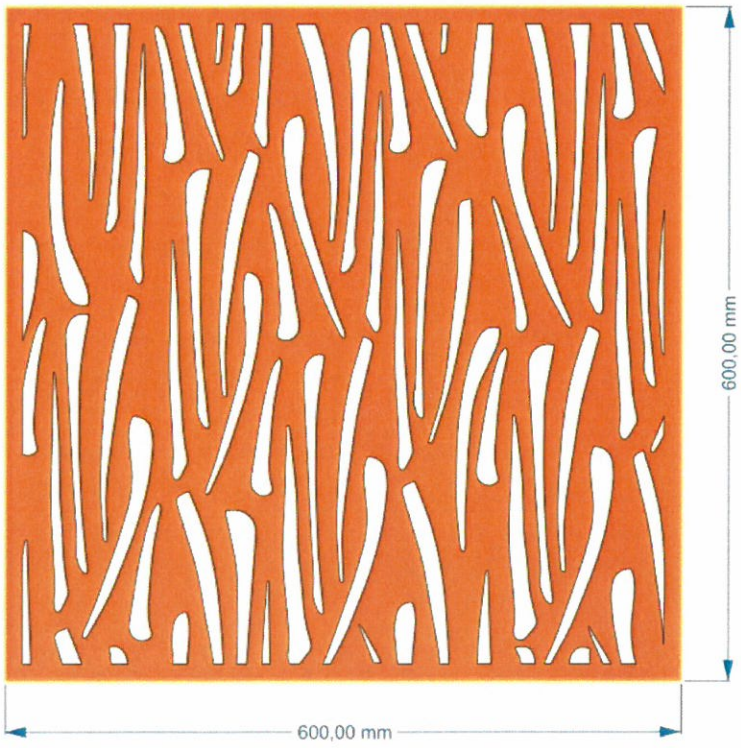
Testing standard: HRN EN ISO 354:2004 – Acoustics -- Measurement of sound absorption in a reverberation room (ISO 354:2003; EN ISO 354:2003)

Evaluating standard: HRN EN ISO 11654:1998 – Acoustics -- Sound absorbers for use in buildings – Rating of sound absorption (ISO 11654:1997; EN ISO 11654:1997)

Description of tests samples (information provided by the client):

PRODUCT NAME : SONITUS ACOUSTICS DECOSORBER NATUR TWIG
DESCRIPTION : mid frequency absorber
MATERIAL :
>Polyester foam 25kg / +-2kg m3, 4 kPa +- 0,6 kPa, fire retardant according to FMVSS302 <100mm/min
fire retardant according to FMVSS302 <100mm/min
>4mm PLYWOOD
>BLACK FLOCK COATING 1mm
COLOR : ANTHRAZITE FOAM WITH DIFFERENT FRONT PLATE FINISH
DIMENSIONS : 600x600x80mm
OPEN AREA : 29,2 %





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Test sample Absorber Sonitus Acoustics Decosorber Natur Twig have nominal dimensions: 600 mm x 600 mm, thickness: 80 mm, were tested (photo 1 and 2).

Measured mass of the Sonitus Acoustics Decosorber Natur Twig absorber per piece: 1,47 kg.

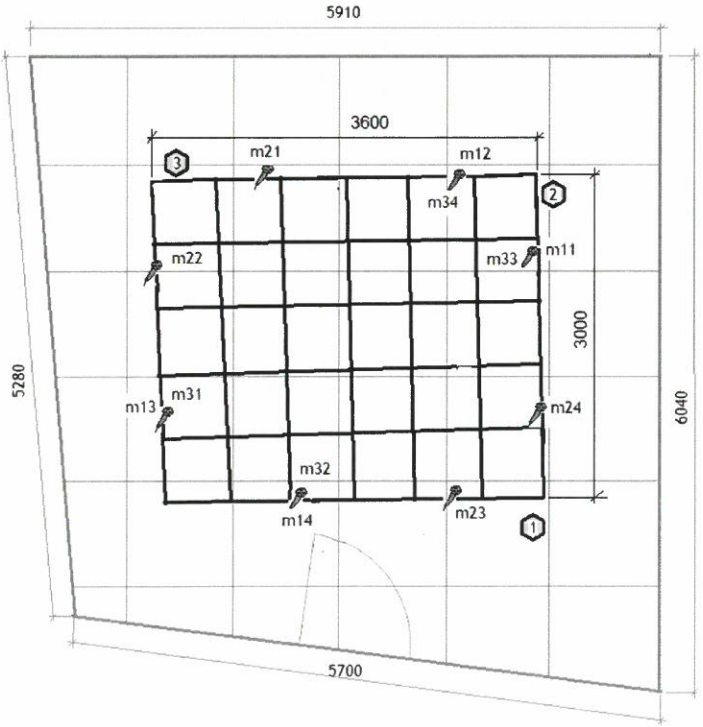
Photo 1

Photo 2

Installation method of test samples:

For measuring sound absorption of Sonitus Acoustics Decosorber Natur Twig, 30 pieces of absorber, dimensions: 600 mm x 600 mm, were placed on the floor of the reverberation room and formed a surface of 10,80 m^2 (Sketch 1).

Lateral surfaces of the Sonitus Acoustics Decosorber Natur Twig absorbers hadn't been protected while performing test, so they were a part of the absorption surface (photo 3 and 4), additional 1,02 m^2.



Sketch 1

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Photo 3

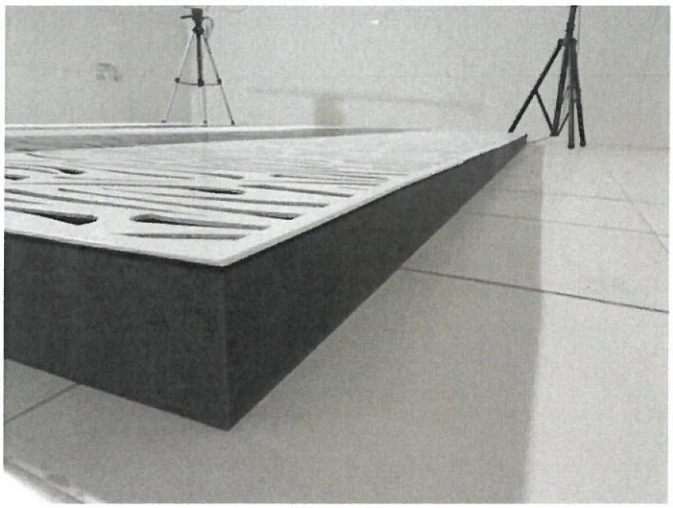

Photo 4

Description of a reverberation room:

- volume: 194,8 m^3,
- area: floor 32,65 m^2, ceiling: 32,65 m^2, walls: 136,77 m^2,
- diffusers: pieces 8, total area: 30,17 m^2.

Test conditions:

- number of microphone positions: 12 (m11... m34),
- number of loudspeaker positions: 3,
- number of averaging on individual position microphone/ loudspeaker: 3.

Measuring and testing equipment:

- hand-held analyzer, type 2270 (Dual Channel), Bruel & Kjær, serial number: 2679276,
- sound pressure calibrator, type 4231, Bruel & Kjær, serial number: 3023871,
- thermohygrometer, ROTRONIC, type Hygroclip S, laboratory mark 1680, serial number: 23535 011,
- condenser microphone, type 4189, Bruel & Kjær, serial number: 2670475,
- preamplifier, type ZC 0026, Bruel & Kjær, serial number: 2877,
- power amplifier, type 2716, Bruel & Kjær, serial number: 2486522,
- sound source, type 4296, Bruel & Kjær, serial number: 2485310,
- barometer, serial number: 225558, laboratory mark 1135.

Test results:

The sound absorption coefficient (α_S) and partical sound absorption coefficient (α_p) of tested samples as a function of frequency is shown in table and diagram. In presenting the results, the following symbols are used:

f – centre frequency of the one-third-octave band (Hz),
α_S – sound absorption coefficient,
α_p– partical sound absorption coefficient (for each octave band),
T_1 – reverberation time of the empty reverberation room (s),
T_2 – reverberation time of the reverberation room with test samples (s),
α_W – weighted sound absorption coefficient.

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Results of sound absorption measurements of absorber Sonitus Acoustics Decosorber Natur Twig

Client:	SONITUS d.o.o., Tina Ujevića 26, HR-48000 Koprivnica
Manufacturer:	SONITUS d.o.o., Tina Ujevića 26, HR-48000 Koprivnica
Building product:	absorber Sonitus Acoustics Decosorber Natur Twig
Laboratory sample No.:	LGF 228/21
Measuring assembly made by:	laboratory staff
Date of test:	2021-09-30
Area of test samples:	S = 11,82 m^2
Volume of the reverberation room:	V = 194,8 m^3

Climatic conditions in the empty reverberation room (2021-09-30):

- temperature 21,8 °C,
- relative air humidity 56,5 %,
- air pressure: 100,3 kPa,

Climatic conditions in the reverberation room with test samples (2021-09-30):

- temperature 22,1 °C
- relative air humidity 57,6 %
- air pressure: 100,2 kPa

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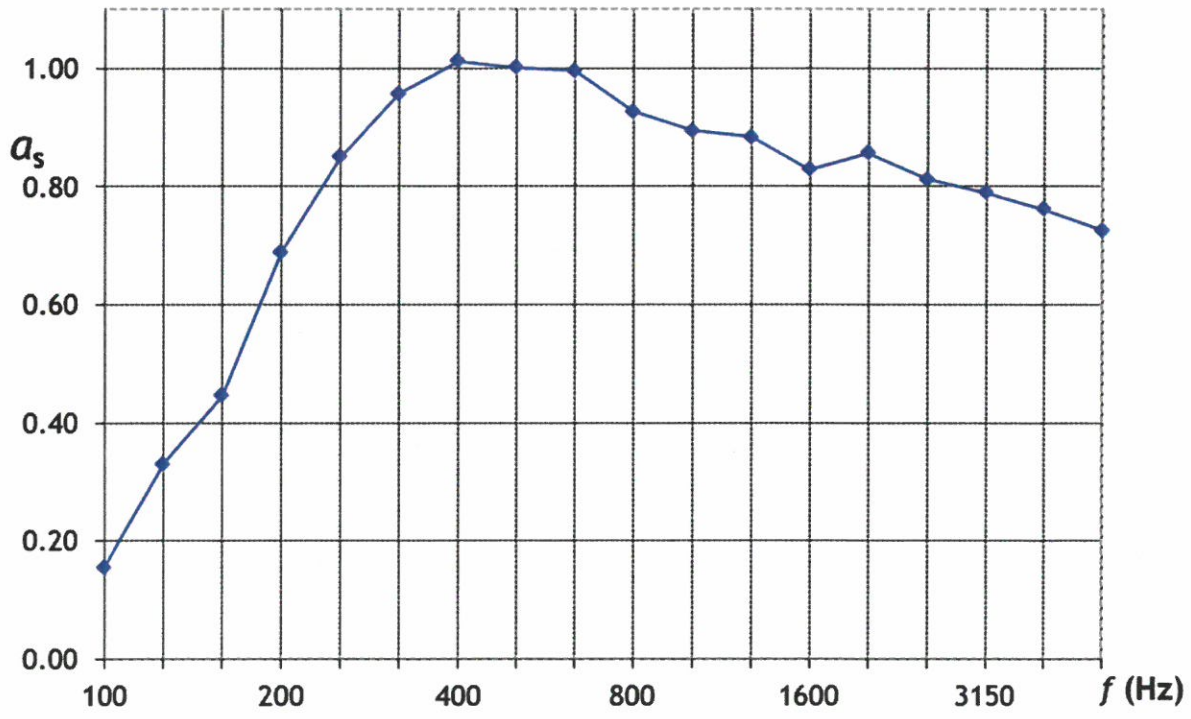
Frequency f (Hz)	Reverberation time of empty reverberation room T_1 (s)	Reverberation time of reverberation room with test samples T_2 (s)	Sound absorption coefficient α_S
100	17.42	8.62	0.16
125	12.98	4.95	0.33
160	12.27	4.00	0.45
200	10.9	2.84	0.69
250	9.58	2.35	0.85
315	9.44	2.14	0.96
400	8.88	2.02	1.01
500	9.32	2.06	1.00
630	8.96	2.05	1.00
800	8.09	2.11	0.93
1000	7.75	2.14	0.89
1250	7.16	2.11	0.88
1600	6.49	2.14	0.83
2000	5.84	2.02	0.86
2500	5.24	2.01	0.81
3150	4.42	1.91	0.79
4000	3.62	1.78	0.76
5000	2.88	1.62	0.73

Sound absorption coefficient:



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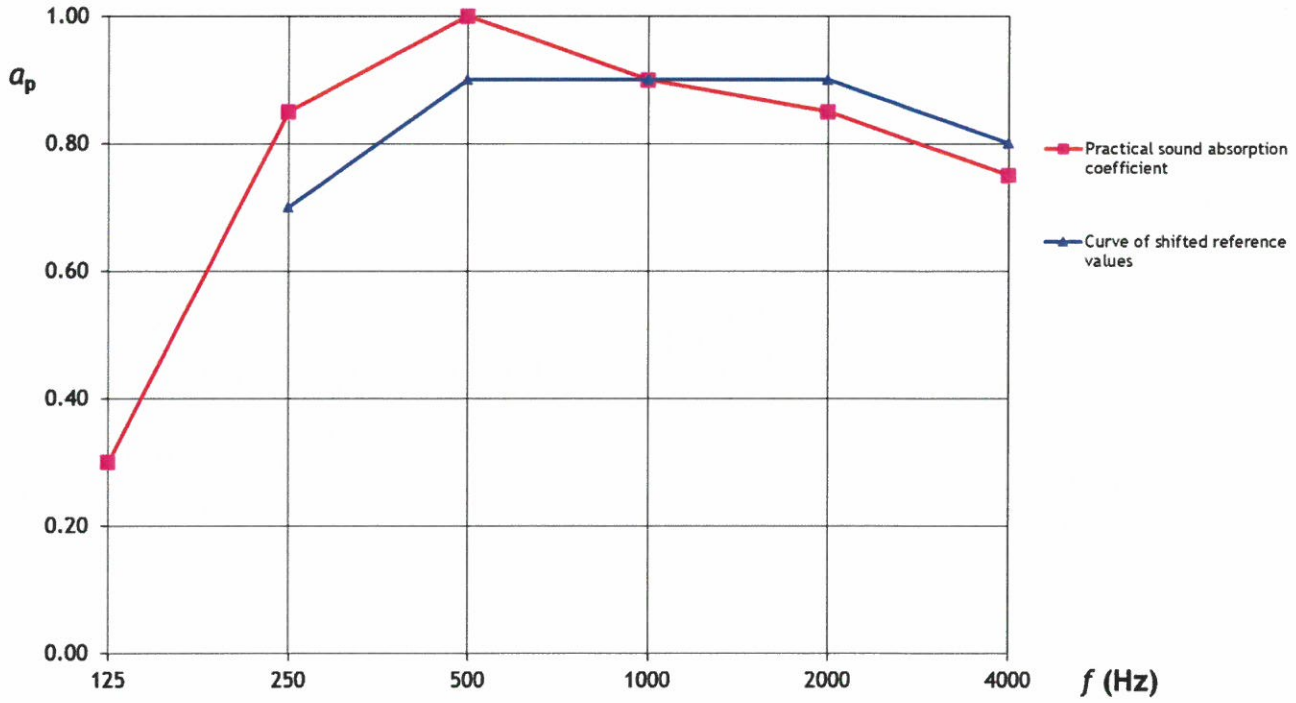
Classification of the sound absorption measurement results of absorber Sonitus Acoustics Decosorber Natur Twig, according to HRN EN ISO 11654: 1998

Frequency	Curve of shifted reference values	Practical sound absorption coefficient
***f* (Hz)**		α_p
125		0.30
250	0.70	0.85
500	0.90	1.00
1000	0.90	0.90
2000	0.90	0.85
4000	0.80	0.75



Absorber Sonitus Acoustics Decosorber Natur Twig manufactured by SONITUS d.o.o., Tina Ujevića 26, HR-48000 Koprivnica	
Weighted sound absorption coefficient	Sound absorption class according to HRN EN ISO 11654:1998
α_w = 0,90	**A**