



January 14, 2009

Audiowig
Ville Eriksson
Laukkavuorenkatu 3
FI-20610 Turku

DETERMINATION OF ACOUSTIC ABSORPTION COEFFICIENT IN LABORATORY CONDITIONS

Description of the commission

Client: Audiowig, Ville Eriksson, December 10, 2009.
Date of delivery: January 7, 2009.
Mounted by: Petra Virjonen (FIOH).

Description of the specimen

Name: **Wigfoam acoustic panel**
Type: **Flock Sine, thickness 6-10 cm**
Manufacturer: Audiowig, Laukkavuorenkatu 3, FIN-20610, Turku
Other features: Specimen size of 9,9 m² was requested by the client. Requirement for minimum specimen area is 10,0 m².

Results

The acoustic absorption coefficient α_s was determined in conformance with ISO 354:2003 (EN ISO 354:2003). The absorption class was determined in conformance with EN ISO 11654:1997. The absorption class of the tested specimen was **A**. For detailed test results, see Annex 1.

Annexes

Annex 1: Test results (1 page)
Annex 2: Mounting of specimen (1 page)
Annex 3: Measurement arrangements (1 page)

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Tämän selosteen julkaisu kokonaan tai osittain on sallittu ainoastaan Työterveyslaitoksen kirjallisella luvalla. Testaustulokset pätevät ainoastaan testatuille näytteille.



This test report or any part of it shall not be reproduced without the written approval of the Finnish Institute of Occupational Health. The test results are valid only for the tested items.



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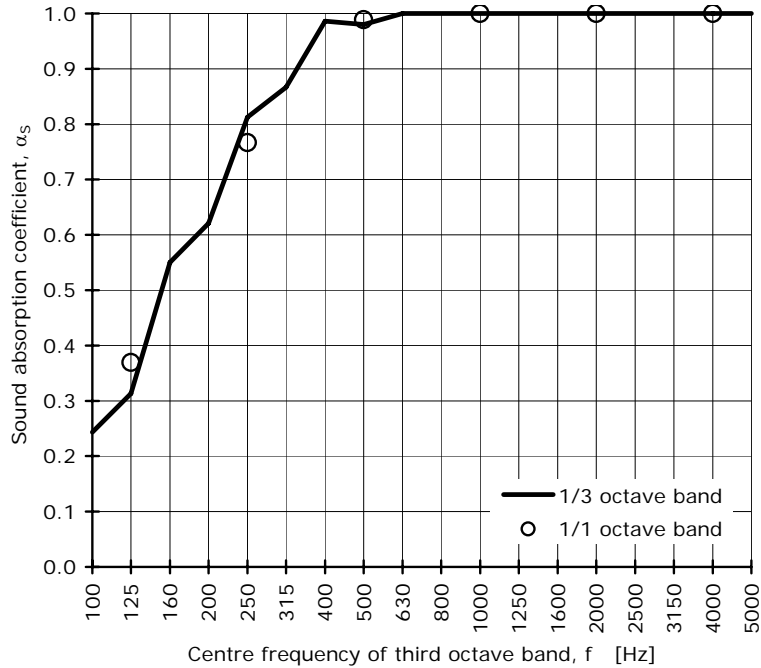
Determination of acoustic absorption coefficient according to ISO 354:2003

Specimen: **Wigfoam Flock Sine acoustic wall panel**
Sine wave profiled foam plastic, nylon covering. Two waves along the shorter edge per panel.
Largest/average/smallest thickness 10/8/6 cm. Surface mass 2.6 kg/m².

Manufacturer: Audiowig
Client: Audiowig, Ville Eriksson
Laboratory: Finnish Institute of Occupational Health, Work Environment Development, Acoustics
Lemminkäisenkatu 14-18 B, FIN-20520 Turku, Finland

Specimen area: 9.9 m² Test room volume: 155 m³
Temperature of test room: 21 °C (without / with specimen) Room boundary area: 179 m²
Relative humidity: 52 % (without / with specimen) Test date: 7.1.2009
Atmospheric pressure: 996 kPa (without / with specimen) Test file identification: T070109a-I
T070109m-ww

f (Hz)	1/3 α _s	1/1 α _s	1/1 α _p
100	0.24		
125	0.31	0.37	0.35 **
160	0.55		**
200	0.62		
250	0.81	0.77	0.75
315	0.87		
400	0.99		
500	0.98	0.99	1.00
630	1.00		
800	1.00		
1000	1.00	1.00	1.00
1250	1.00		
1600	1.00		
2000	1.00	1.00	1.00
2500	1.00		
3150	1.00		
4000	1.00	1.00	1.00
5000	1.00		

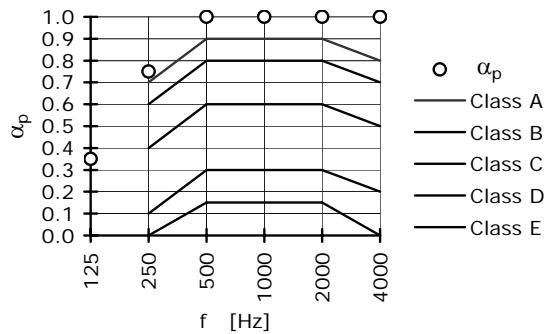


Absorption class (EN ISO 11654)

A

** Total absorption area of the empty test room is higher than ISO 354 requires. The specimen area should be 10-12 m².

The uncertainty of the test result is higher than ISO 354 expects.



Petra Virjonen
research scientist, test performer

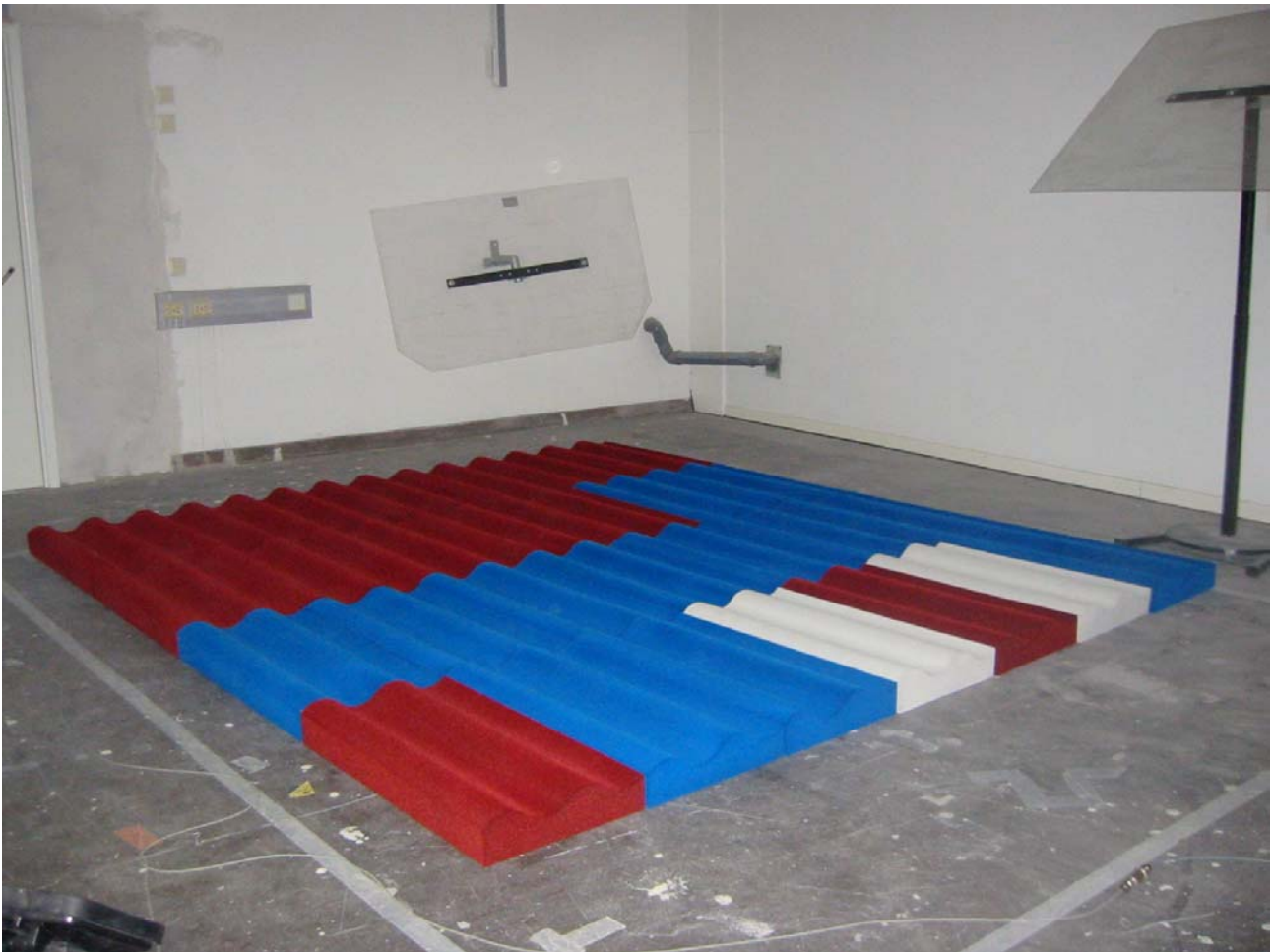


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Mounting of specimen

The specimen was mounted directly on the floor of the reverberation room in conformance with ISO 354:2003 Annex B (Type A, see picture above). The panels were mounted side by side without significant slits. The side edges of the specimen were not covered because the edges of the panels are exposed when the material is normally installed in actual application.

The size of one panel was 0.4 x 0.8 m (0.32 m²). Thickness of the panel varied between 6 and 10 cm:s. 28 panels were used. The area of the edges (0.96 m²) were included in the reported test specimen area resulting in total area of 9.9 m².





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1 Acoustical measurements

The test signal was produced to the test room using three fixed omnidirectional loudspeakers (6 x Seas W12CY001). The test signal (pink noise) was produced by a real time analyzer (Brüel & Kjær 2133) and amplified with terminal amplifier (QSC 1300 W USA). The sound pressure level in the reverberation room was measured with a condenser microphone on a tripod (Brüel& Kjær 4190 equipped with a pre-amplifier Brüel& Kjær 2669).

The reverberation time at third-octave bands was measured with the real time analyzer (Brüel & Kjær 2133) using 20 dB decay range. All frequency bands were measured using 2 sources simultaneously and 6 microphone locations. In every location an ensemble average of 10 decays was measured. The total number of reverberation time measurements was 12.

The acoustical measurement equipment fulfilled the following IEC standards and grades of accuracy:

IEC 60651	Sound level meters	type 1
IEC 60804	Integrating sound level meters	type 1
IEC 61260	Octave-band and fractional-octave-band filters	class 1
IEC 60942	Sound level calibrators	class 1

The test laboratory operates in conformance with EN/ISO/IEC 17025.

2 Other measurements

The temperature, the ambient atmospheric pressure and the relative humidity of the measurement room were measured using an environmental measurement device (Thermo Recorder TR-73U). The specimen was weighed with a 150 kg precision weighing machine (PM 150). The dimensions of the specimen were measured with a roll meter (K-Prof).

3 The test room

The reverberation room was equipped with six fixed diffuser panels. The positions were selected randomly in respect with altitude, angle and position. The amount of diffusers and their arrangement fulfills the requirements of Annex A in ISO 354. The reverberation time of the reverberation room fulfills the requirements of ISO 354 for 155 m³ test room except for the third octave bands 125 and 160 Hz, where the reverberation time was at most 20 % below the minimum required reverberation time.

4 References to the ISO standards

ISO 354:2003 (E) Acoustics - Measurement of sound absorption in a reverberation room, International Organization for Standardization, 2003, Genève, Switzerland.

SFS-EN ISO 11654 Acoustics - Sound absorbers for use in buildings - Rating of sound absorption, International Organization for Standardization, 1997, Genève, Switzerland.