

Determination of sound absorption and class in a reverberation room according to SFS EN ISO 354-2003 and SFS EN ISO 11654-1997



FINAS
Finnish Accreditation Service
T001 (EN ISO/IEC 17025)

Requested by: Standard AS

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Marja tn 9
Tallinn 10617
ESTONIA

Order Martin Kull, Order VTT-O-169282-15 dated 16.6.2015

Contact person **VTT Expert Services Ltd**
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Assignment **Determination of sound absorption and class in a reverberation room**

Specimen The customer supplied samples to the laboratory on 8.9.2015.

The sample was as follows:

- Floor screen (FE FEVS1217L)

The drawing and other information of the sample delivered by the customer are presented in Appendix 2.

Date and place of testing Sample was tested on 29.9.2015 at VTT Expert Services Ltd research hall 1.

Installation and Measuring The tested sample were installed onto the reverberation chamber floor. Test was performed by the VTT Expert Services Ltd Technical Expert Veijo Sivonen.

Method and equipment The sound absorption coefficient, α_s was measured according to the standard SFS EN ISO 354-2003 [1] and the rating of sound absorption (calculation of α_w) was determined according to the standard SFS EN ISO 11654-1997 [2] Reverberation room dimensions and measuring equipment are presented in Appendix 3.

Result The sound absorption coefficient α_s in one-third-octave bands and the practical sound absorption coefficient α_p in octave bands are presented in Appendix 1. The weighted sound absorption coefficient α_w and the sound absorption class are presented also in Table 1.

Table 1. Weighted sound absorption coefficient α_w and sound absorption class

Product name	Weighted sound absorption coefficient α_w	Sound absorption class
Floor screen FE FEVS1217	0.75	C

Espoo, 25.11.2015



Tero Jalkanen
Product Manager



Veijo Sivonen
Technical Expert

VTT Expert Services Ltd is notified body No. NB 0809

FINAS Finnish Accreditation Service has accredited our laboratory (T001, VTT Expert Services Ltd) to perform measurements according to SFS EN ISO 354-2003 and SFS EN ISO 11654-1997.

References

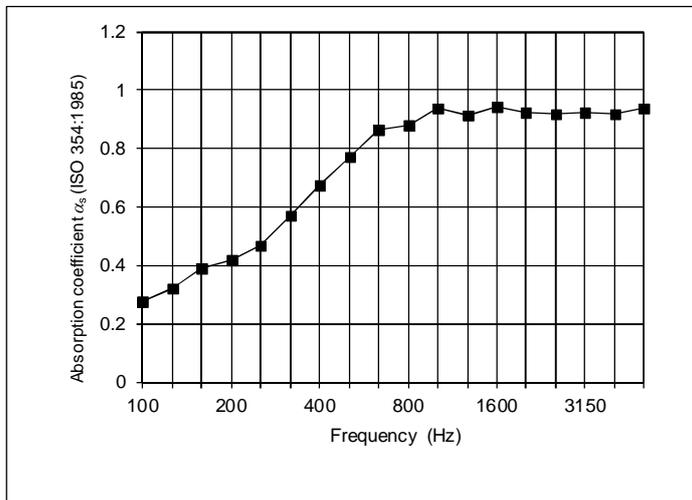
- [1] *SFS EN ISO 354-2003*, Acoustics - Measurement of sound absorption in a reverberation room.
 [2] *SFS EN ISO 11654-1997*, Acoustics - Sound absorbers for use in buildings – Rating of sound absorption

Appendices
Distribution

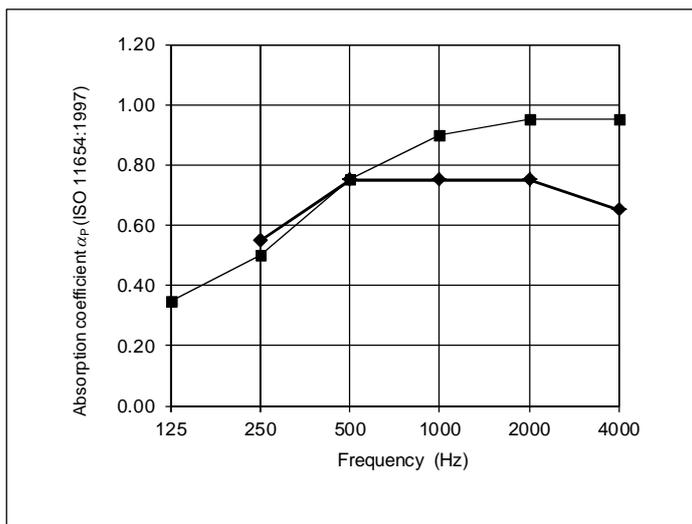
3
 Customer Original
 Archive Original

Determination of sound absorption and classification

Client	Standard AS Marja tn 9, Tallinn 10617	Volume of the rev. room	201 m ³
Order	Martin Kull	Area of the inner surfaces	209 m ²
Test place	VTT Expert Services Ltd.	Area of the sample	12.1 m ²
Task	Determination of absorption coefficient Octave values and classification	Temperature and relative humidity of reverberation room	
Test date	29.9.2015	Empty	21 °C 52 %
Sample	Floor screen FE FEVS1217	Sample	21 °C 52 %
Board size	1206 x 1667 x 40 mm mm x 3 pcs		
Surface mass	5.54 kg/m ²		
Arrangements	Sample specimens in upright position.		



Frequency (Hz)	T ₁ (s)	T ₂ (s)	α_s
100	4.36	3.00	0.28
125	5.28	3.23	0.32
160	5.34	3.01	0.39
200	5.07	2.82	0.42
250	5.24	2.74	0.47
315	5.41	2.51	0.57
400	4.74	2.16	0.67
500	4.55	1.97	0.77
630	4.84	1.89	0.86
800	4.99	1.89	0.88
1000	5.10	1.83	0.94
1250	4.87	1.83	0.91
1600	4.45	1.73	0.94
2000	4.00	1.68	0.92
2500	3.61	1.61	0.92
3150	3.15	1.51	0.92
4000	2.59	1.37	0.92
5000	2.16	1.23	0.94



Octave values and classification

Frequency (Hz)	Ref. curve	α_p
125		0.35
250	0.55	0.50
500	0.75	0.75
1000	0.75	0.90
2000	0.75	0.95
4000	0.65	0.95

Weighted absorption coefficient, α_w : 0.75

Sound absorption class: C (H)

Absorption classes: A, B, C, D, E and no classification

The test results relate only to the sample tested.



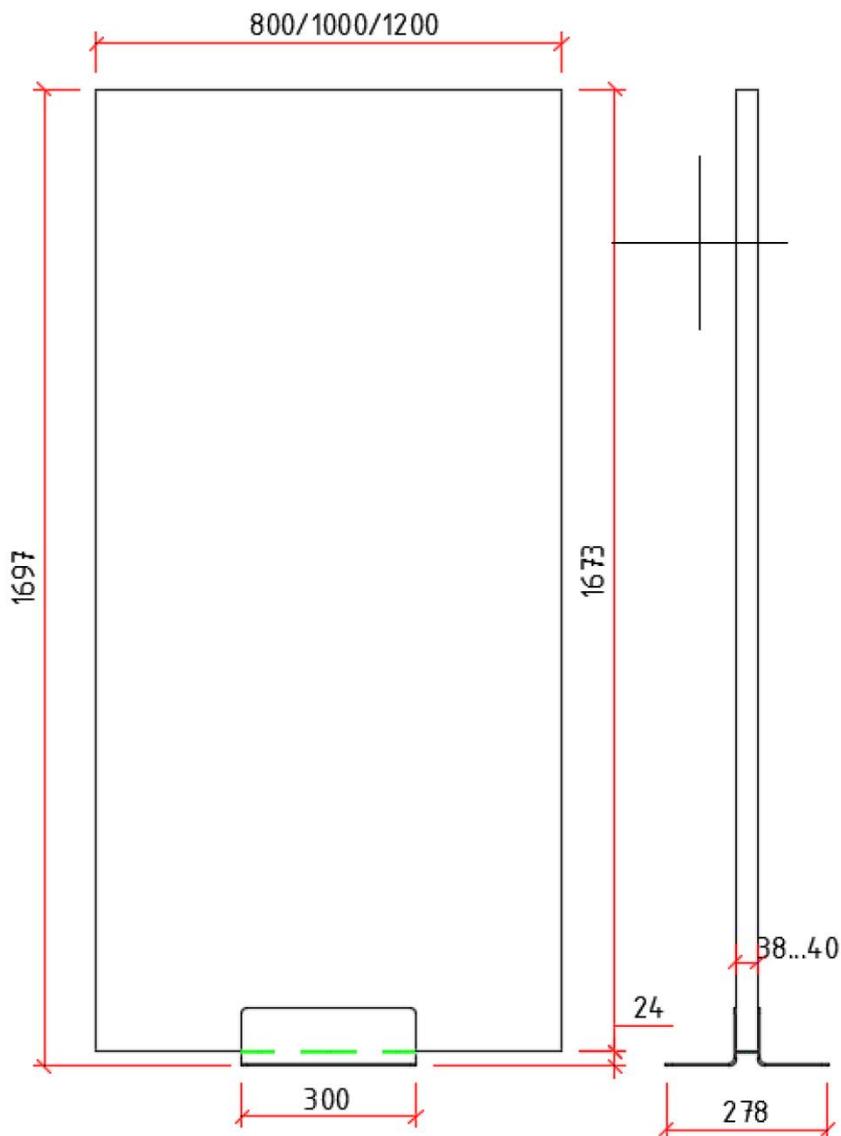
PRODUCT CARD

Name of product: Floor screen FE FEVS1217

Dimensions: 1200x1700(H) mm

Screen: 2x20mm polyester fibre board, dark grey

Base: 4mm bended and welded steel sheet, painted black



The test results relate only to the sample tested.

Reverberation room dimensions and measuring equipment

Measuring equipment	Name	Serial No.
Condenser microphone	B&K (Brüel&Kjær) 4134	2527717
Microphone preamplifier	B&K 2660	2554550
Rotating microphone boom	B&K 3923	2630663
Power amplifier	Peavey PV 2600	
Loudspeakers	Sinmarc V121L	
Real-time analyser	Norsonic 121	31429
Sound calibrator	B&K 4228	1704462

	Floor	Height	Volume
Reverberation room dimensions	5.95 m x 7.20 m	4.70 m	201 m ³

Thickness of the concrete walls, floors and ceilings of the reverberation rooms is 0.25 m

The test results relate only to the sample tested.