



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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**Requested by** Standard AS  
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 sample to the laboratory on 8.9.2015.

The sample was as follows:

- Armchair (POINT POTTMJK)

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,  $\alpha_s$  was measured according to the standard SFS EN ISO 354-2003 [1] and the rating of sound absorption (calculation of  $\alpha_w$ ) 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  $\alpha_s$  in one-third-octave bands and the practical sound absorption coefficient  $\alpha_p$  in octave bands are presented in Appendix 1. The weighted sound absorption coefficient  $\alpha_w$  and the sound absorption class are presented also in Table 1.

*Table 1. Weighted sound absorption coefficient  $\alpha_w$  and sound absorption class*

Product name	Weighted sound absorption coefficient $\alpha_w$	Sound absorption class
Armchair POINT POTTMJK	0.50	D

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**

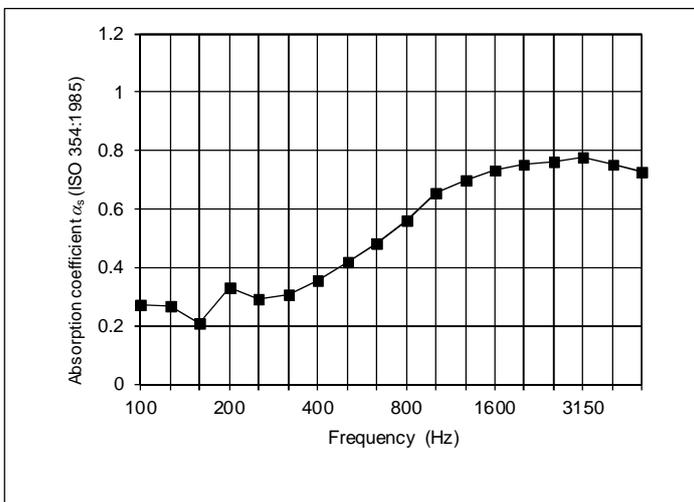
- [1] *SFS EN ISO 354-2003*, Acoustics - Measurement of sound absorption in a reverberation room.
- [2] *SFS EN ISO 11654-1997*, Acoustics - Sound absorbers for use in buildings – Rating of sound absorption

Appendices  
Distribution

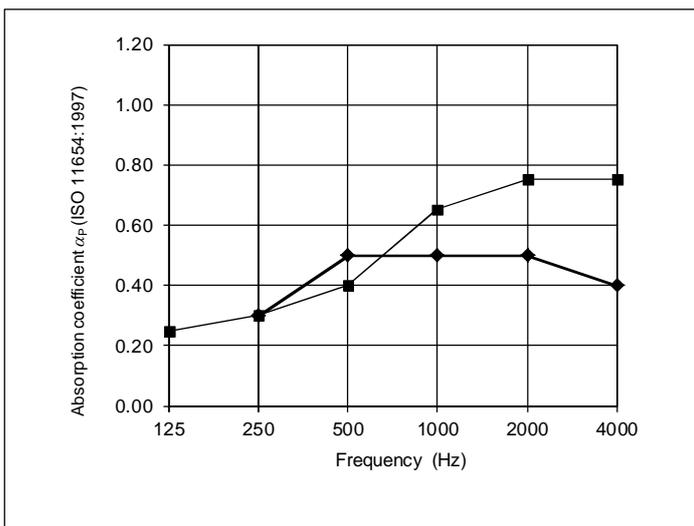
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Customer                      Original  
Archive                        Original

## Determination of sound absorption and classification

Client	Standard AS Marja tn 9, Tallinn 10617	Volume of the rev. room	201 m <sup>3</sup>
Order	Martin Kull	Area of the inner surfaces	209 m <sup>2</sup>
Test place	VTT Expert Services Ltd.	Area of the sample	15 m <sup>2</sup>
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	POINT POTTMIJK armchair	Sample	21 °C      54 %
Board size			
Surface mass			
Arrangements	Sample specimens in upright position.		



Frequency (Hz)	T <sub>1</sub> (s)	T <sub>2</sub> (s)	$\alpha_s$
100	4.36	2.82	0.27
125	5.28	3.20	0.27
160	5.34	3.52	0.21
200	5.07	2.86	0.33
250	5.24	3.07	0.29
315	5.41	3.07	0.30
400	4.74	2.66	0.36
500	4.55	2.41	0.42
630	4.84	2.32	0.48
800	4.99	2.17	0.56
1000	5.10	2.00	0.66
1250	4.87	1.89	0.70
1600	4.45	1.77	0.73
2000	4.00	1.67	0.75
2500	3.61	1.59	0.76
3150	3.15	1.48	0.78
4000	2.59	1.37	0.75
5000	2.16	1.26	0.73



### Octave values and classification

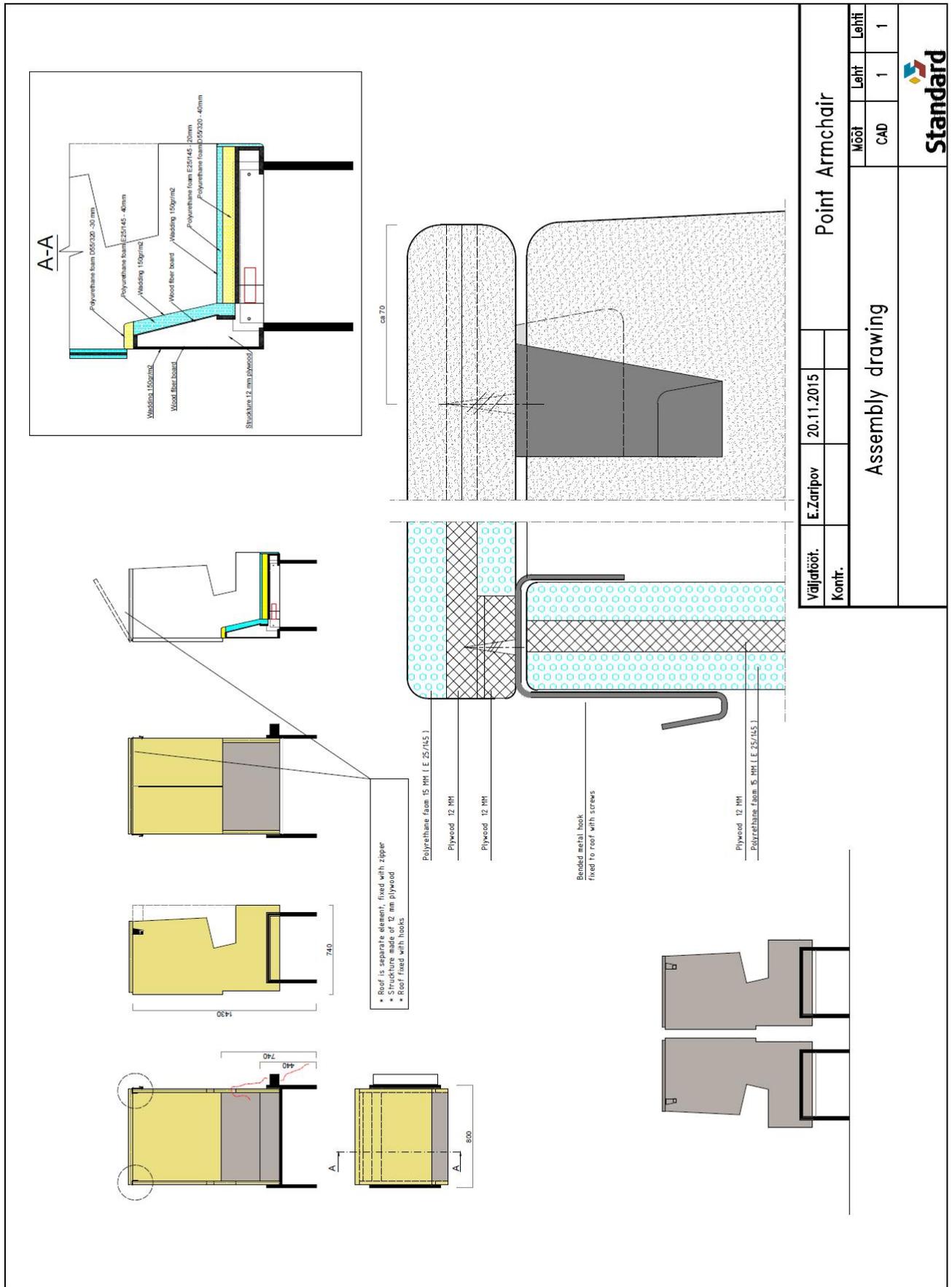
Frequency (Hz)	Ref. curve	$\alpha_p$
125		0.25
250	0.30	0.30
500	0.50	0.40
1000	0.50	0.65
2000	0.50	0.75
4000	0.40	0.75

Weighted absorption coefficient,  $\alpha_w$ : 0.50

Sound absorption class: D (H)

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

The test results relate only to the sample tested.



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## 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 <sup>3</sup>

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.