

ABSORPTION MEASUREMENTS FOR TWO TABLE SCREENS FROM GÖTESSONS INDUSTRI AB

CONCLUSIONS

The sound absorption area for table screens, ScreenIT A30, in two different sizes from Götessons Industri AB has been measured according to the reverberation room method (SS-EN ISO 354:2003). The measurements have been evaluated according to SS 25269:2013 and are presented in separate measurement protocols as absorption area per object.

1. CLIENT

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2. ASSIGNMENT

To measure the sound absorption area according to SS-EN ISO 354:2003 for two table screens, ScreenIT A30, from Götessons Industri AB. The measurements shall be evaluated according to SS 25269:2013. Akustikverkstan is accredited for both these standards.

3. TEST OBJECTS

ScreenIT A30

ScreenIt A30 consists of a wooden frame with 30 mm PET-fibre filling with a foam laminated textile (Event Screen) as surface material, total thickness 40 mm. See figure 1 and 2 for one of three measurement setups of each screen.

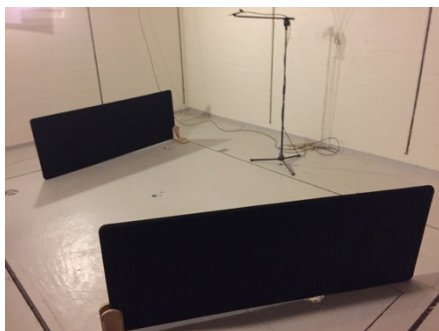


Fig. 1: Measurement setup, ScreenIT A30
1800 x 650 mm



Fig. 2: Measurement setup, ScreenIT A30
1800 x 800 mm

4. MEASUREMENT PROCEDURE

The absorption measurements were performed according to the standard SS-EN ISO 354:2003. The measurements were made with three speaker positions and four microphone positions. The results for sound absorption area were evaluated according to SS 25269:2013. The test specimen area fulfils the requirements in SS-EN ISO 354:2003.

The measurements were performed 2017-04-28 in Akustikverkstan's reverberation room in Skultorp, Skövde, Sweden. More information on the test facilities can be found in Appendix 2. The measurement result for each test is the average of 3 measurements with 2 objects in 3 different positions.

5. MEASUREMENT EQUIPMENT

Table 1 lists the equipment used during the measurements. The equipment fulfils class 1 according to SS-EN 61672-1, 60942 and 61260. Date for the latest calibration is available in the instrument journal of Akustikverkstan.

Instrument	Manufacturer and type	Serial number	Internal designation
Measurement computer	HP Zbook	-	DA02
Front end	National Instruments NI 9234/NI cDAQ-9171	1918620/ 190DB0B	AN05
Microphone	Roga MI-17	592	MI04
Microphone	Roga MI-17	593	MI05
Microphone	Roga MI-17	594	MI06
Microphone	Roga MI-17	595	MI07
Speaker	IMA Kub 1	8	HÖ7
Speaker	IMA Kub 1	9	HÖ8
Speaker	IMA Kub 1	10	HÖ9
Equalizer	Monacor MEQ-2152	-	Lab
Amplifier	Denon POA-2200	-	Lab

Table 1: Equipment used during the measurements.

6. RESULTS

Detailed measurement results for all test specimens are available in the measurement protocols belonging to this report according to table 2. The results are only valid for the tested samples.

Test sample	Size (mm)	Measurement protocol
ScreenIT A30 table screen	1800 x 650 x 40	17-091-M1
ScreenIT A30 table screen	1800 x 800 x 40	17-091-M2

Table 2: List of measurement protocols.

7. COMMENTS AND INTERPRETATIONS

Kammarkollegiet, the Swedish authority dealing with public purchasing, has published advice regarding purchasing of sound absorbers. They define the value N_{10} according to the formula:

$$N_{10} = \frac{10}{A_{500}}$$

A_{500} is the sound absorption area at the 500 Hz octave band for the tested object. The N_{10} value is developed to be a single value metric for speech sound absorption and describes how many objects are needed to obtain 10 m² of sound absorption area in the 500 Hz octave band. If the sound absorption is lower in any octave above 500 Hz, the lower value will be used instead.

Measurement protocol	Test object	N_{10}
M1	ScreenIT A30	7.7
M2	ScreenIT A40	6.7

Table 3: N_{10} -values for the measured products.

8. MEASUREMENT UNCERTAINTY

The uncertainties in the measured sound absorption coefficients have been estimated to the values in table 4. The uncertainty corresponds to one standard deviation. The uncertainties for the sound absorption area measurement are concluded from the same values multiplied with the test specimen area.

50 Hz ± 0.10	63 Hz ± 0.08	80 Hz ± 0.07	100 Hz ± 0.06	125 Hz ± 0.05	160 Hz ± 0.04	200 Hz ± 0.03
250 Hz ± 0.03	315 Hz ± 0.03	400 Hz ± 0.03	500 Hz ± 0.03	630 Hz ± 0.03	800 Hz ± 0.03	1 kHz ± 0.03
1,25 kHz ± 0.03	1,6 kHz ± 0.03	2 kHz ± 0.03	2,5 kHz ± 0.03	3,15 kHz ± 0.03	4 kHz ± 0.03	5 kHz ± 0.03

Table 4: Measurement uncertainty for each third octave.

This report should always be used in its complete context, even though the measurement protocols may be used independently.

Carl Nyqvist

Reviewed by Anders Grimmerhed, 2017-05-05

APPENDIX 1: MEASURED REVERBERATION TIMES

f(Hz)	Empty	ScreenIT A30 1800 x 650 (avg. 3 measurements)	ScreenIT A30 1800 x 800 (avg. 3 measurements)
50	9.33	8.66	8.63
63	8.78	7.45	7.46
80	8.42	7.10	7.10
100	7.18	6.28	6.25
125	6.80	5.84	5.58
160	5.43	4.50	4.36
200	5.52	4.18	4.02
250	5.33	4.02	3.84
315	5.38	4.03	3.76
400	5.37	3.85	3.71
500	4.74	3.41	3.26
630	4.30	3.20	3.02
800	4.67	3.35	3.11
1000	4.54	3.23	2.96
1250	3.90	2.85	2.66
1600	3.52	2.65	2.45
2000	3.14	2.40	2.26
2500	2.78	2.13	2.01
3150	2.34	1.85	1.76
4000	1.91	1.57	1.52
5000	1.50	1.25	1.21

Number of test objects	0	2	2
Temperature (°C)	16.4	16.4	16.4
RH (%)	41.0	41.0	40.0

APPENDIX 2: INFORMATION ABOUT THE REVERBERATION ROOM

The reverberation room is rectangular, measuring Length x Width x Height = 5.85 x 4.65 x 7.35 m. The room volume is 200 m³ and the total area of the walls, ceiling and floor is 209 m². There are 22 diffusors (size 0.775 x 1.25 m) randomly installed in the room. The reverberation time between 50 and 200 Hz is controlled with membrane absorbers on the walls.

The test specimen is put on the floor on the mounting area (10 m², 2.6 x 3.85 m) according to figure B2.1. The mounting area consists of a concrete slab that can be lowered up to 700 mm below the floor.

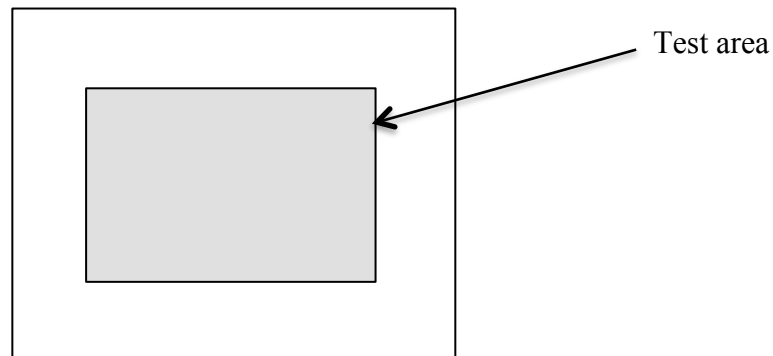


Figure B2.1: Plane drawing of the reverberation room with the test area.