Akustikverkstan Lab AB
Kinnegatan 23, 531 33 Lidköping, Sweden, +46 510 - 911 44

richard.karlsson@akustikverkstan.se
Direct: +46 76 511 24 10

SOUND ABSORPTION MEASUREMENTS FOR SCREENIT A30, DESK AND FLOOR SCREENS

The sound absorption for the products ScreenIT A30 in different sizes has been measured according to the reverberation room method (SS-EN ISO 354:2003. The sound absorption area has been evaluated according to ISO 20189:2018.

The results as N_{10}-values as defined by *Kammarkollegiet* for the objects measured for sound absorption area are presented in the table below.

Measurement protocol	Test object	N_{10}
M1	ScreenIT A30 760 x 450 x 40 mm standing on the floor	33
M2	ScreenIT A30 800 x 650 x 40 mm standing on the floor	20
M3	ScreenIT A30 1600 x 450 x 40 mm standing on the floor	14
M4	ScreenIT A30 1200 x 1600 x 40 mm standing on the floor	5.3
M5	ScreenIT A30 1600 x 1600 x 40 mm standing on the floor	3.8

1 CLIENT

Götessons Industri AB
Contact: Stellan Bygård, stellan.b@gotessons.se, +46 321 68 77 61

2 ASSIGNMENT

To measure the sound absorption for the product ScreenIT in different sizes according to SS-EN ISO 354:2003 and evaluate according to ISO 20189:2018. Akustikverkstan is accredited for these standards.

3 TEST OBJECTS

3.1 ScreenIT A30 – Desk screen

ScreenIT A30 consist of 30mm noise absorbing recycled polyester framed in wood and coated with a foam laminated fabric. The tested sizes are 760 x 450 mm, 800 x 650 mm and 1600 x 450 mm.
The absorber is intended to be mounted on a desk.

Figure 1: ScreenIT A30, size 760 x 450 mm

Figure 2: ScreenIT A30, size 800 x 650 mm

Figure 3: ScreenIT A30, size 1600 x 450 mm

3.2 ScreenIT A30 – Floor screen

ScreenIT A30 consist of 30mm noise absorbing recycled polyester framed in wood and coated with a foam laminated fabric. The tested sizes are 1200 x 1600 mm and 1600 x 1600 mm. The absorber is intended to be standing on the floor.

Figure 4: ScreenIT A30, size 1200 x 1600 mm

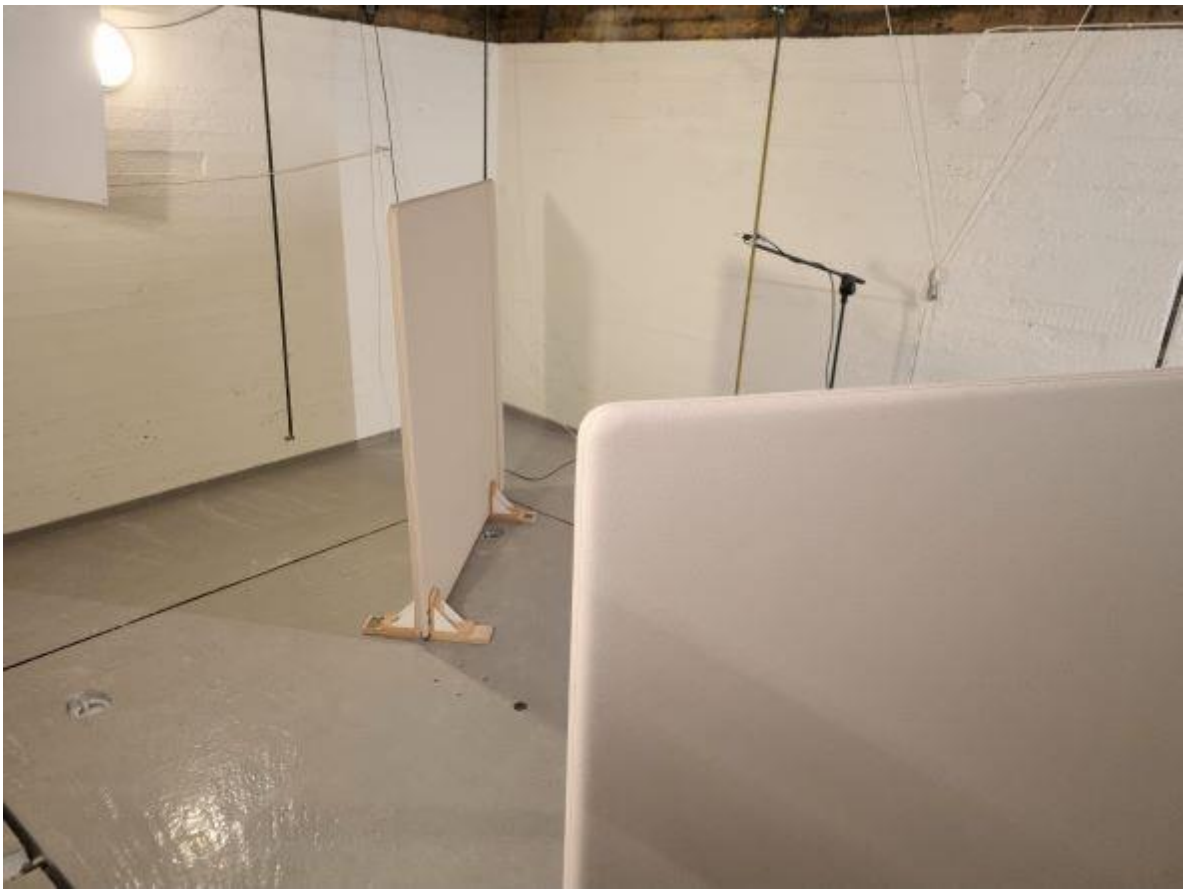


Figure 5: ScreenIT A30, size 1600 x 1600 mm

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 ISO 20189:2018. The test specimen area fulfils the requirements in SS-EN ISO 354:2003.

The measurements were performed by Richard Karlsson 2022-11-11 in Akustikverkstan's reverberation room in Skultorp, Skövde, Sweden. More information on the test facilities can be found in Appendix 2.

The equipment used is presented in Appendix 3.

5 RESULTS

Detailed measurement results are available in the measurement protocols belonging to this report, 2629-R2-M1 to M5. The results are only valid for the tested sample. The measurement accuracy is described in Appendix 4.

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

6 COMMENTS AND INTERPRETATIONS

6.1 N_{10}-value

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 sound absorber. 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 m^2 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.

7 DEVIATIONS FROM THE STANDARD

ISO 354 has a requirement that the temperature shall be at least 15°. The temperature was below 15° during the measurements. This deviation is not experienced to influence the results of fibrous sound absorbers.

Richard Karlsson

Reviewed by Carl Nyqvist, 2022-12-07

APPENDIX 1: MEASURED REVERBERATION TIMES

f(Hz)	Empty	M1: ScreenIT A30 76 x 45 cm	M2: ScreenIT A30 80 x 65 cm	M3: ScreenIT A30 160 45 cm	M4: ScreenIT A30 120 x 160 cm	M5: ScreenIT A30 160 x 160 cm
50	8.99	8.14	7.89	7.49	6.79	6.24
63	8.99	8.14	8.00	7.66	7.40	7.08
80	7.87	6.85	6.76	6.46	6.66	6.21
100	6.58	5.82	5.66	5.65	5.84	5.55
125	6.85	6.03	5.81	5.57	5.68	5.03
160	5.38	4.51	4.32	4.01	4.15	3.66
200	5.35	4.20	3.91	3.75	3.99	3.48
250	5.34	4.21	3.97	3.73	3.79	3.32
315	5.47	4.21	3.95	3.94	3.66	3.22
400	5.29	4.18	3.73	3.85	3.45	3.06
500	4.87	3.77	3.35	3.34	3.08	2.72
630	4.49	3.54	3.08	3.15	2.87	2.50
800	4.91	3.60	3.19	3.16	2.95	2.60
1000	4.89	3.57	3.02	3.25	2.82	2.50
1250	4.27	3.27	2.76	2.95	2.58	2.32
1600	3.96	3.04	2.57	2.72	2.42	2.14
2000	3.54	2.72	2.36	2.49	2.24	2.00
2500	3.19	2.49	2.16	2.31	2.06	1.86
3150	2.72	2.18	1.92	1.99	1.85	1.69
4000	2.30	1.88	1.69	1.74	1.64	1.51
5000	1.88	1.56	1.42	1.46	1.40	1.27

Number of objects	0	6	6	4	2	2
Temperature (°C)	12.6	13.9	13.4	13.1	12.9	12.7
RH (%)	67	61	63	64	65	66

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 m^3 and the total area of the walls, ceiling and floor is 209 m^2. 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 m^2, 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.

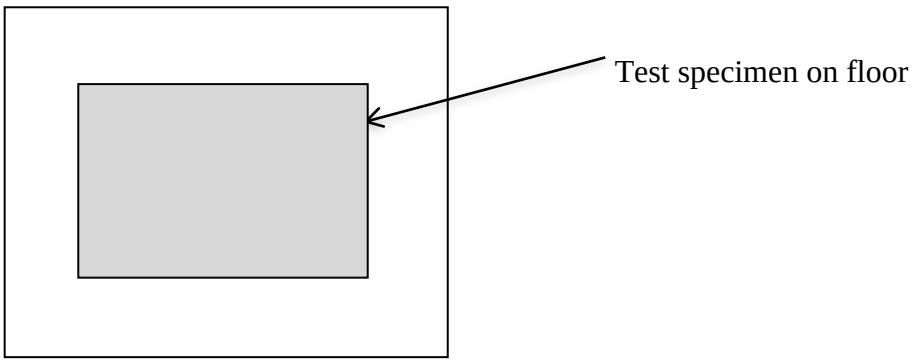


Figure A2.1: Plane drawing of the reverberation room with the positions of the test specimens.

APPENDIX 3: MEASUREMENT EQUIPMENT

Table A3.1 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	Manufacture and type	Serial number	Internal designation
Measurement computer	HP Zbook		DA02
Front end	National Instruments NI 9234	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 A3.1: Equipment used during the measurements.

APPENDIX 4: MEASUREMENT UNCERTAINTY

The uncertainties in the measured sound absorption coefficients have been estimated to the values in table A4.1. The uncertainty corresponds to one standard deviation. The uncertainties for sound absorption area are concluded from the same values multiplied with the test specimen area.

50 Hz	**63 Hz**	**80 Hz**	**100 Hz**	**125 Hz**	**160 Hz**	**200 Hz**
± 0.10	± 0.08	± 0.07	± 0.06	± 0.05	± 0.04	± 0.03
250 Hz	**315 Hz**	**400 Hz**	**500 Hz**	**630 Hz**	**800 Hz**	**1 kHz**
± 0.03	± 0.03	± 0.03	± 0.03	± 0.03	± 0.03	± 0.03
1.25 kHz	**1.6 kHz**	**2 kHz**	**2.5 kHz**	**3.15 kHz**	**4 kHz**	**5 kHz**
± 0.03	± 0.03	± 0.03	± 0.03	± 0.03	± 0.03	± 0.03

Table A4.1: Measurement uncertainty for each third octave.

SceenIT A30 760 x 450

SOUND ABSORPTION AREA ACCORDING TO SS-EN ISO 354:2003 and ISO 20189:2018

Measurement of sound absorption area in a reverberation room

Ackred. nr. 10445
Provning
ISO/IEC 17025

Report number:
2629-R2-M1
Date
2022-12-08

Frequency f [Hz]	Sound absorption area per object [m² Sabine]	
50	0.06	
63	0.06	0.07
80	0.10	
100	0.11	
125	0.11	0.14
160	0.19	
200	0.27	
250	0.27	0.28
315	0.29	
400	0.27	
500	0.32	0.30
630	0.32	
800	0.40	
1000	0.40	0.39
1250	0.38	
1600	0.41	
2000	0.45	0.44
2500	0.46	
3150	0.46	
4000	0.50	0.50
5000	0.54	

N_{10} = 33

Client: Götessons

Manufacturer: Götessons

Product identification: ScreenIT A30

Description of test specimen: Desk screen made of recycled polyester.
Each unit is 76 x 45 x 4 cm.
The measurement has been carried out with the units standing on the floor.

Reverberation room volume: 200 m³

Temperature: 13.9 °C (empty: 12.6 °C)

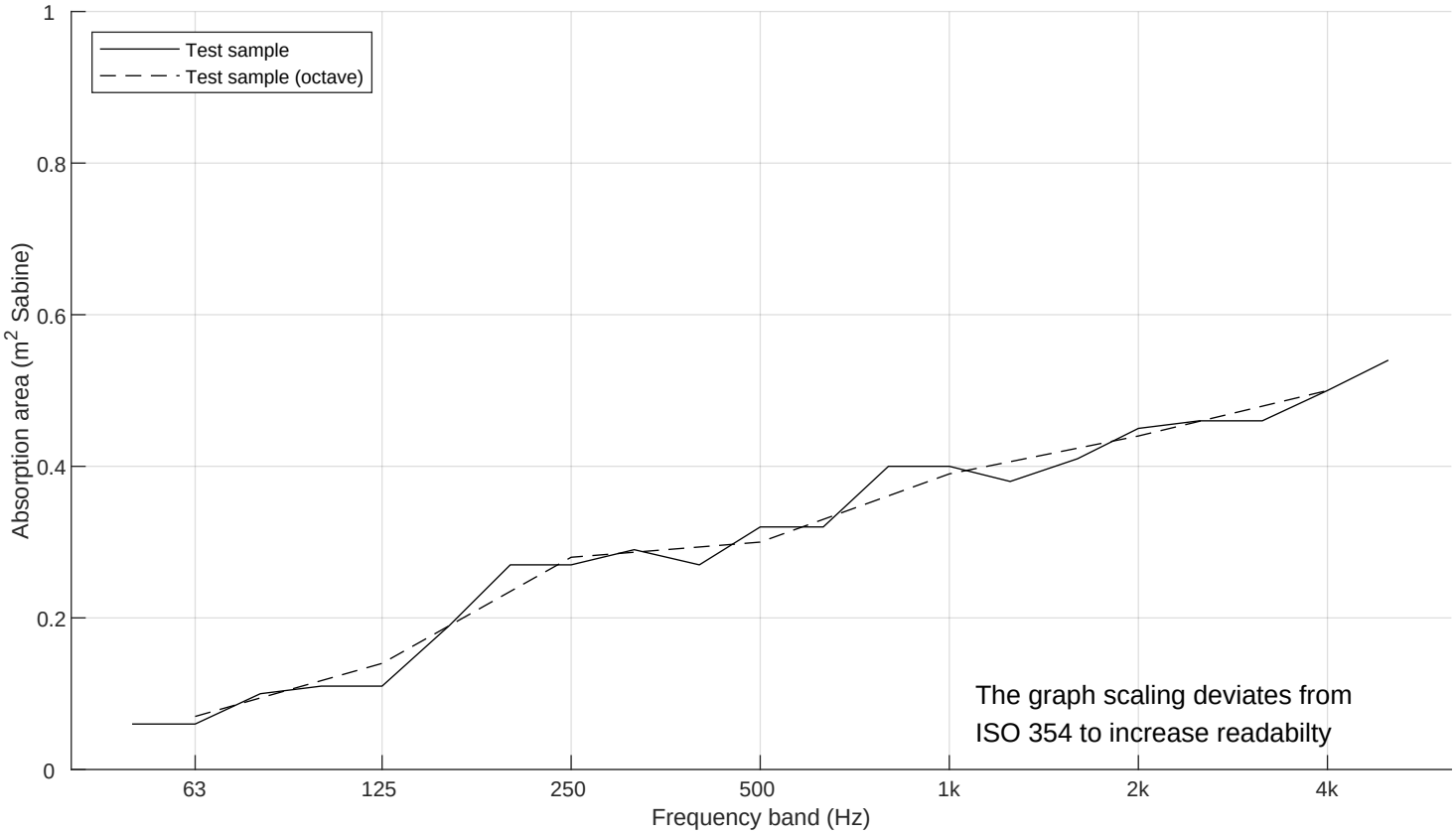
Air humidity: 61 % (empty: 67 %)

Air pressure: 101.4 kPa (empty:101.4 kPa)

Number of objects: 6

Measurement date: 2022-11-11

Measured by: Richard Karlsson



AKUSTIKVERKSTAN

ScreenIT A30 800 x 650

SOUND ABSORPTION AREA ACCORDING TO SS-EN ISO 354:2003 and ISO 20189:2018

Measurement of sound absorption area in a reverberation room

Ackred. nr. 10445
Provning
ISO/IEC 17025

Report number:
2629-R2-M2
Date
2022-12-01

Frequency f [Hz]	Sound absorption area per object [m² Sabine]	
50	0.08	
63	0.07	0.09
80	0.11	
100	0.13	
125	0.14	0.17
160	0.25	
200	0.37	
250	0.35	0.37
315	0.38	
400	0.43	
500	0.50	0.49
630	0.55	
800	0.59	
1000	0.69	0.66
1250	0.69	
1600	0.74	
2000	0.76	0.77
2500	0.80	
3150	0.82	
4000	0.84	0.85
5000	0.90	

N_{10} = 20

Client: Götessons

Manufacturer: Götessons

Product identification: ScreenIT A30

Description of test specimen: Desk screen made of recycled polyester.
Each unit is 80 x 65 x 4 cm.
The measurement has been carried out with the units standing on the floor.

Reverberation room volume: 200 m³

Temperature: 13.4 °C (empty: 12.6 °C)

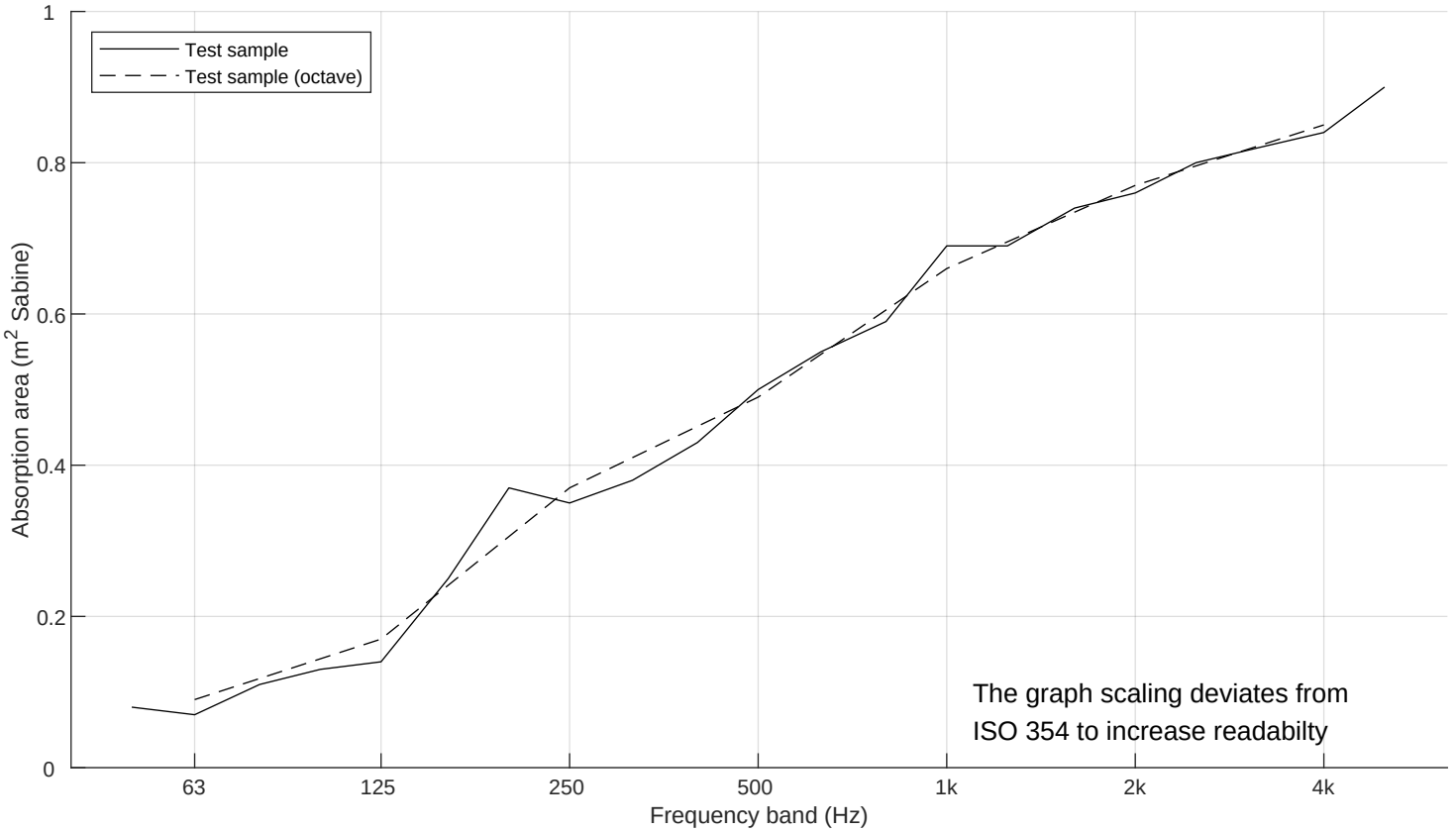
Air humidity: 63 % (empty: 67 %)

Air pressure: 101.4 kPa (empty:101.4 kPa)

Number of objects: 6

Measurement date: 2022-11-11

Measured by: Richard Karlsson



AKUSTIKVERKSTAN

ScreenIT A30 1600 x 450

SOUND ABSORPTION AREA ACCORDING TO SS-EN ISO 354:2003 and ISO 20189:2018

Measurement of sound absorption area in a reverberation room

Ackred. nr. 10445
Provning
ISO/IEC 17025

Report number:
2629-R2-M3
Date
2022-12-07

Frequency f [Hz]	Sound absorption area per object [m^2 Sabine]	
50	0.18	
63	0.16	0.19
80	0.23	
100	0.20	
125	0.27	0.33
160	0.52	
200	0.65	
250	0.66	0.63
315	0.58	
400	0.57	
500	0.76	0.70
630	0.77	
800	0.92	
1000	0.84	0.87
1250	0.85	
1600	0.94	
2000	0.96	0.95
2500	0.96	
3150	1.07	
4000	1.11	1.1
5000	1.22	

N_{10} = 14

Client: Götessons

Manufacturer: Götessons

Product identification: ScreenIT A30

Description of test specimen: Desk screen made of recycled polyester.
Each unit is 160 x 45 x 4 cm.
The measurement has been carried out wit the units standing on the floor.

Reverberation room volume: 200 m^3

Temperature: 13.1 °C (empty: 12.6 °C)

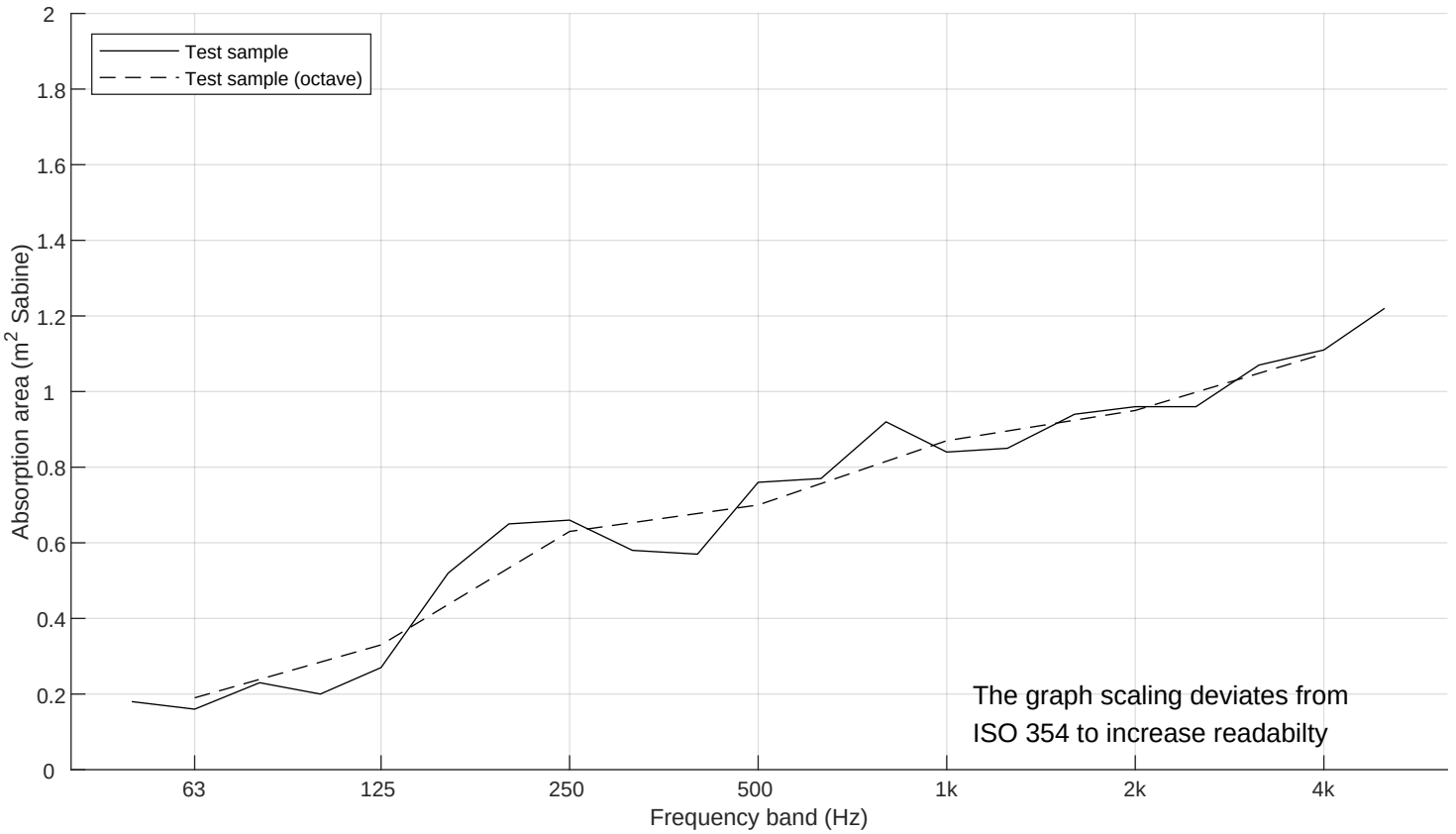
Air humidity: 64 % (empty: 67 %)

Air pressure: 101.4 kPa (empty:101.4 kPa)

Number of objects: 4

Measurement date: 2022-11-11

Measured by: Richard Karlsson



AKUSTIKVERKSTAN

ScreenIT A30 1200 x 1600

SOUND ABSORPTION AREA ACCORDING TO SS-EN ISO 354:2003 and ISO 20189:2018

Measurement of sound absorption area in a reverberation room

Ackred. nr. 10445
Provning
ISO/IEC 17025

Report number:
2629-R2-M4
Date
2022-12-07

Frequency f [Hz]	Sound absorption area per object [m^2 Sabine]	
50	0.58	
63	0.39	0.45
80	0.38	
100	0.31	
125	0.49	0.57
160	0.90	
200	1.03	
250	1.25	1.3
315	1.48	
400	1.63	
500	1.95	1.9
630	2.05	
800	2.21	
1000	2.44	2.4
1250	2.50	
1600	2.62	
2000	2.67	2.7
2500	2.79	
3150	2.80	
4000	2.83	2.9
5000	2.94	

N_{10} = 5.3

Client: Götessons

Manufacturer: Götessons

Product identification: ScreenIT A30

Description of test specimen: Floor screen made of recycled polyester.
Each unit is 120 x 160 x 4 cm.
The measurement has been carried out with the units standing on the floor.

Reverberation room volume: 200 m^3

Temperature: 12.9 °C (empty: 12.6 °C)

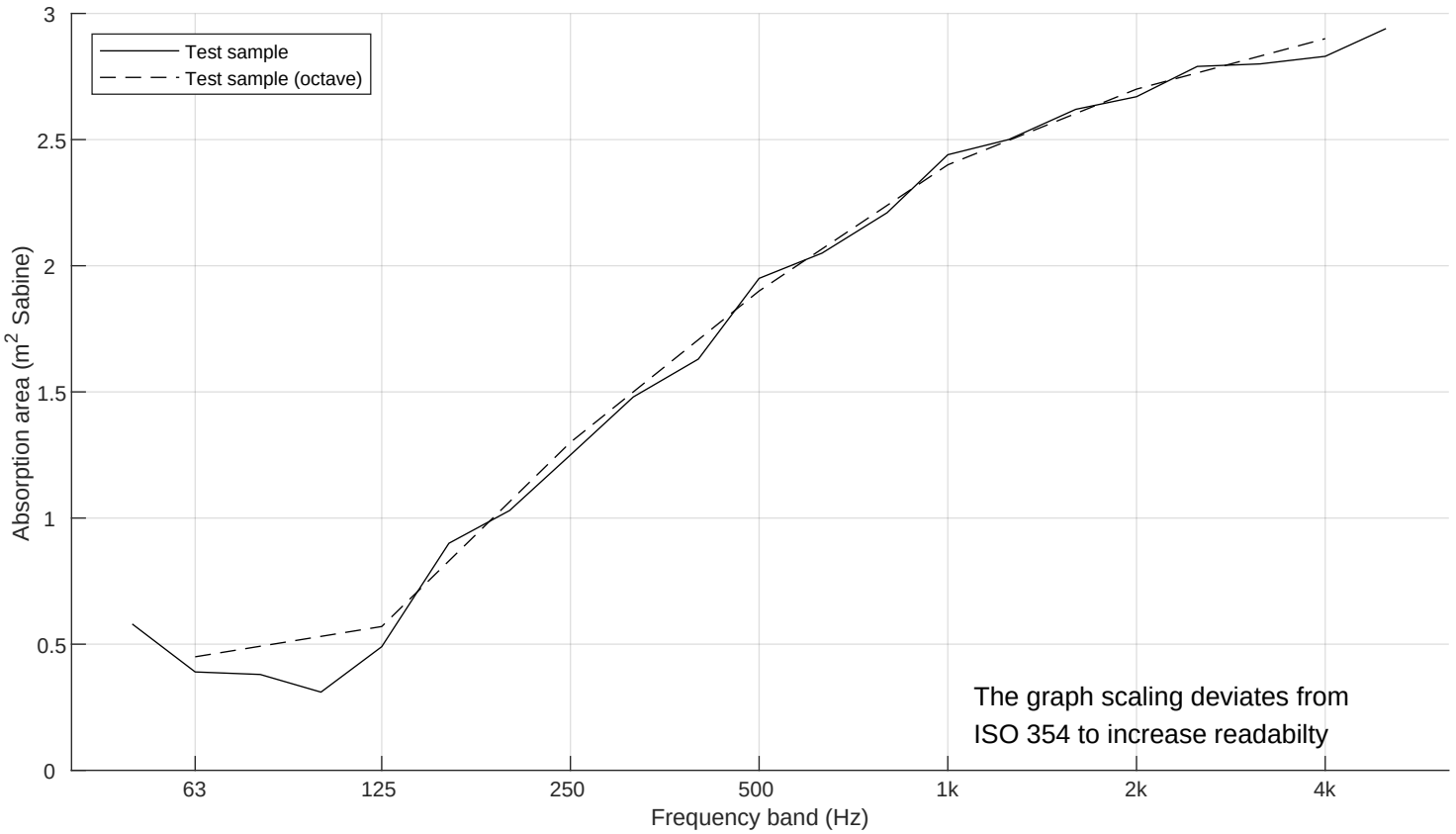
Air humidity: 65 % (empty: 67 %)

Air pressure: 101.4 kPa (empty:101.4 kPa)

Number of objects: 2

Measurement date: 2022-11-11

Measured by: Richard Karlsson



AKUSTIKVERKSTAN

ScreenIT 1600 x 1600

SOUND ABSORPTION AREA ACCORDING TO SS-EN ISO 354:2003 and ISO 20189:2018

Measurement of sound absorption area in a reverberation room

Ackred. nr. 10445
Provning
ISO/IEC 17025

Report number:
2629-R2-M5
Date
2022-12-08

Frequency f [Hz]	Sound absorption area per object [m² Sabine]	
50	0.80	
63	0.49	0.61
80	0.55	
100	0.46	
125	0.86	0.92
160	1.43	
200	1.64	
250	1.86	1.9
315	2.09	
400	2.24	
500	2.66	2.6
630	2.89	
800	2.96	
1000	3.20	3.1
1250	3.20	
1600	3.50	
2000	3.53	3.6
2500	3.65	
3150	3.63	
4000	3.71	3.8
5000	4.13	

N_{10} = 3.8

Client: Götessons

Manufacturer: Götessons

Product identification: ScreenIT A30

Description of test specimen: Floor screen made of recycled polyester.
Each unit is 160 x 160 x 4 cm.
The measurement has been carried out with the units standing on the floor.

Reverberation room volume: 200 m³

Temperature: 12.7 °C (empty: 12.6 °C)

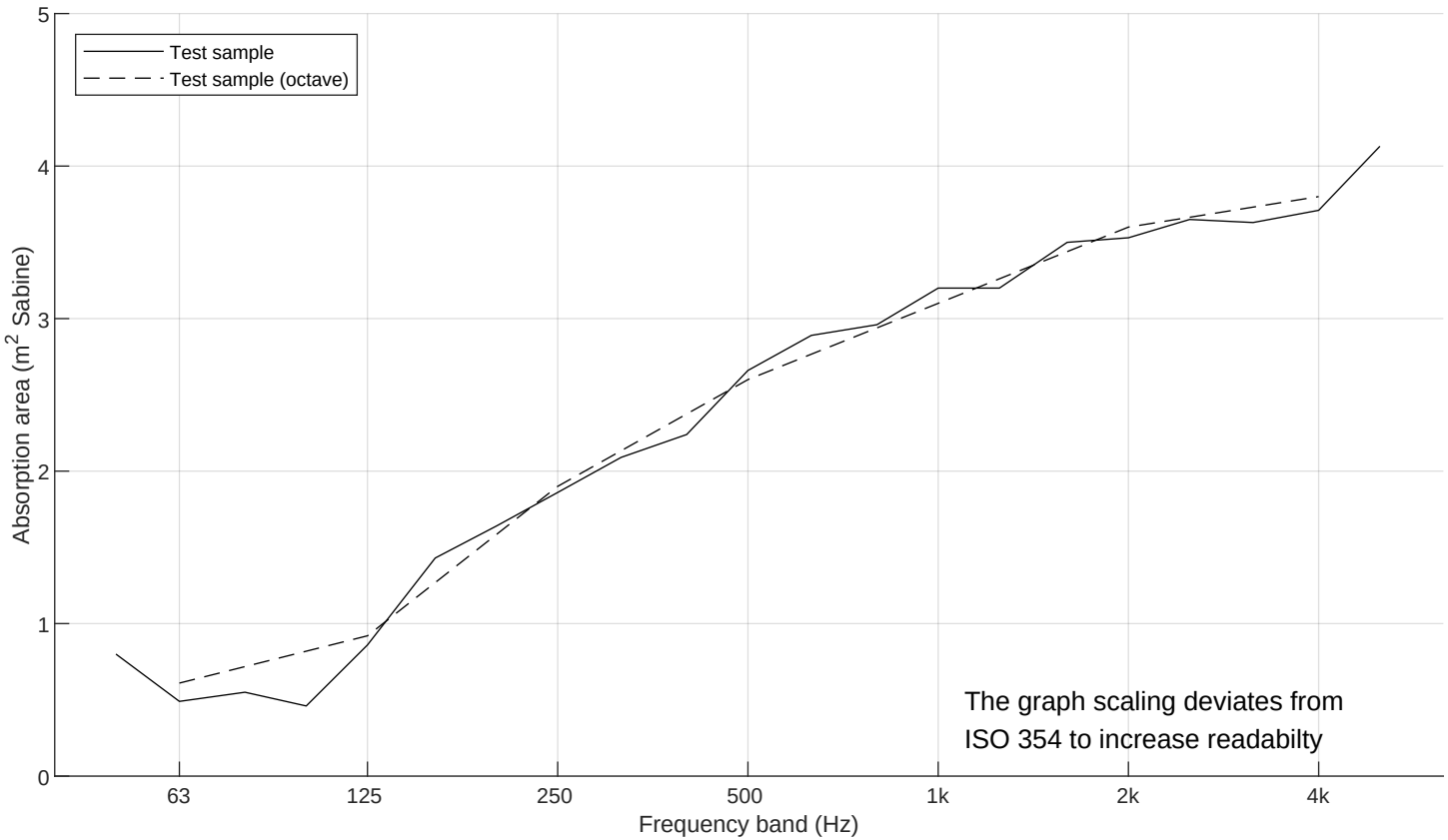
Air humidity: 66 % (empty: 67 %)

Air pressure: 101.4 kPa (empty:101.4 kPa)

Number of objects: 2

Measurement date: 2022-11-11

Measured by: Richard Karlsson



AKUSTIKVERKSTAN