REPORT
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1002 ISO/IEC 17025

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Determination of screen sound attenuation according to ISO 10053 and NT ACOU 085

(2 appendices)

Client

Kinnarps AB

Assignment

To measure screen sound attenuation for two different office screens.

Date of test

2008-11-20 for screen type Zonit 80; 2008-11-21 for screen type Rezon with panel RZLA.

Results

Weighted screen sound attenuation, $\Delta L_{s,W}$, and screen sound attenuation class are calculated according to NT ACOU 085 and given in table 1 for each screen. Screen sound attenuation ΔL_s is given in appendix 2.

Table 1.

Test object	ΔLs,w (dB)	Screen sound attenuation class
Screen type Zonit 80	14	B
Screen type Rezon with panel RZLA	13	B

Test objects

The dimensions of the screen elements for Zonit 80 type are about 1900 mm high, 1200 mm wide and 80 mm thick. Screen Zonit 80 consists of perforated 4 mm board and 60 mm thick mineral wool filling and has three pieces in order to have three variances in height: 1100 mm, 1500 mm and 1900 mm.

The dimensions of the screen elements for Rezon type are about 1785 mm high, 1200 mm wide and 30 mm thick in frame. Screen Rezon consists of five equal pieces of RZLA panels mounted in the 30 mm thick frame, with the size about 345 mm (height) x 1160 mm (width), and 56 mm thick where the absorption material located.

Measurement method

The measurements and evaluations were carried out according to ISO 10053 and NT ACOU 085, respectively.

The screen sound attenuation ΔL_S is defined as

$$\Delta L_S = L_{p0} - L_p - 20 \lg (R/r)$$

where:

L_{p0}	The sound pressure level (dB) measured at the reference position (in front of the loudspeaker directly above the top of the screen but with the screen removed).
L_p	The sound pressure level (dB) measured at the standard position (at the position of the receiver, behind the screen)
R	Distance between the sound source and receiver (m).
r	Distance between the sound source and the measurement position for L_{p0} (m).

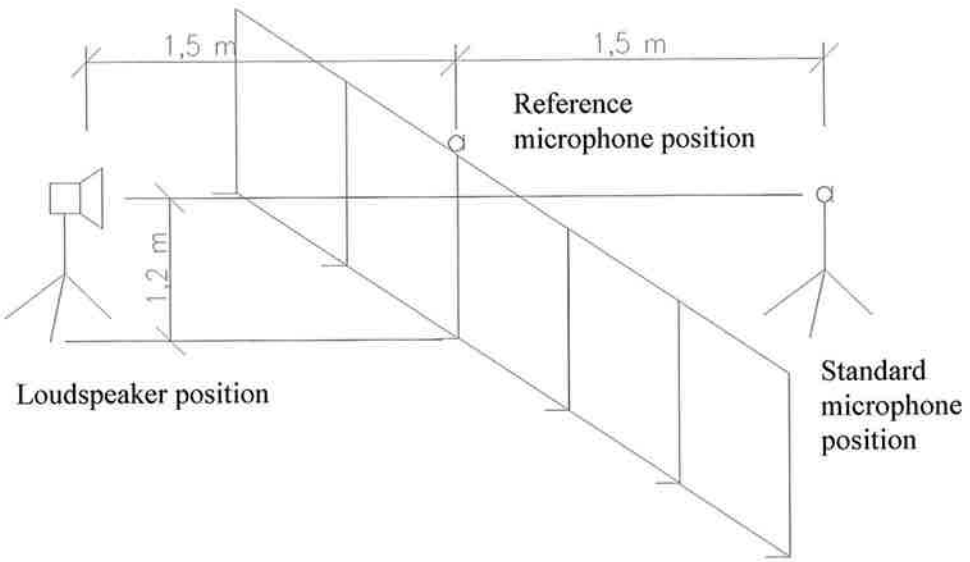

Figure 1: Positioning of microphone and loudspeaker.

The measurements were carried out in a hemi-anechoic room complying with the requirements of ISO 3745 which provides the same measurement conditions as outdoors (sound reflections only from the floor). The arrangement of the measuring site is shown in figure 1.

Mounting

The screen type Zonit 80 was mounted by the client and SP Staff. It consisted of 6 screen elements, each of which was 1,2 m wide, mounted to cover the full diagonal length of the room and then to form an equivalently infinite long screen. The air gap between the floor and the under side of the screen was about 25 mm. The screen height was about 1900 mm.

The screen type Rezon was mounted by SP staff. It consisted of 6 screen elements, each of which was 1,2 m wide, mounted to cover the full diagonal length of the room and then to form an

equivalently infinite long screen. The air gap between the floor and the under side of the screen was about 13 mm. The screen height was about 1785 mm.

The two screen types are shown in appendix 1.

Measurement uncertainty

No estimate of the reproducibility is given in ISO 10053:91. The reproducibility indicates the spread in measured results when carrying out comparison measurements between different laboratories, with different test rooms, equipment, personnel etc. However, the repeatability is stated. The influence of the test room should be small. An estimate of the reproducibility has been made by adding an instrument variance of 0,5 dB. The estimate then becomes:

Frequency (Hz)	Repeatability (dB)	**Estimated reproducibility (dB)**
125 Hz	≤ 1,5 dB	≤ 3,0 dB
250-4000	≤ 1,0 dB	≤ 2,0 dB

List of instruments

Type	**Manufacturer**	**Model no.**	**Serial no**
Sound analyser	01 dB	Harmonie	04227
Microphone	Brüel & Kjær	4189	2495409
Pre-amplifier	Brüel & Kjær	2671	2497454
Calibrator	Brüel & Kjær	4231	1762189
Sound effect source	Brüel & Kjær	4205	649625

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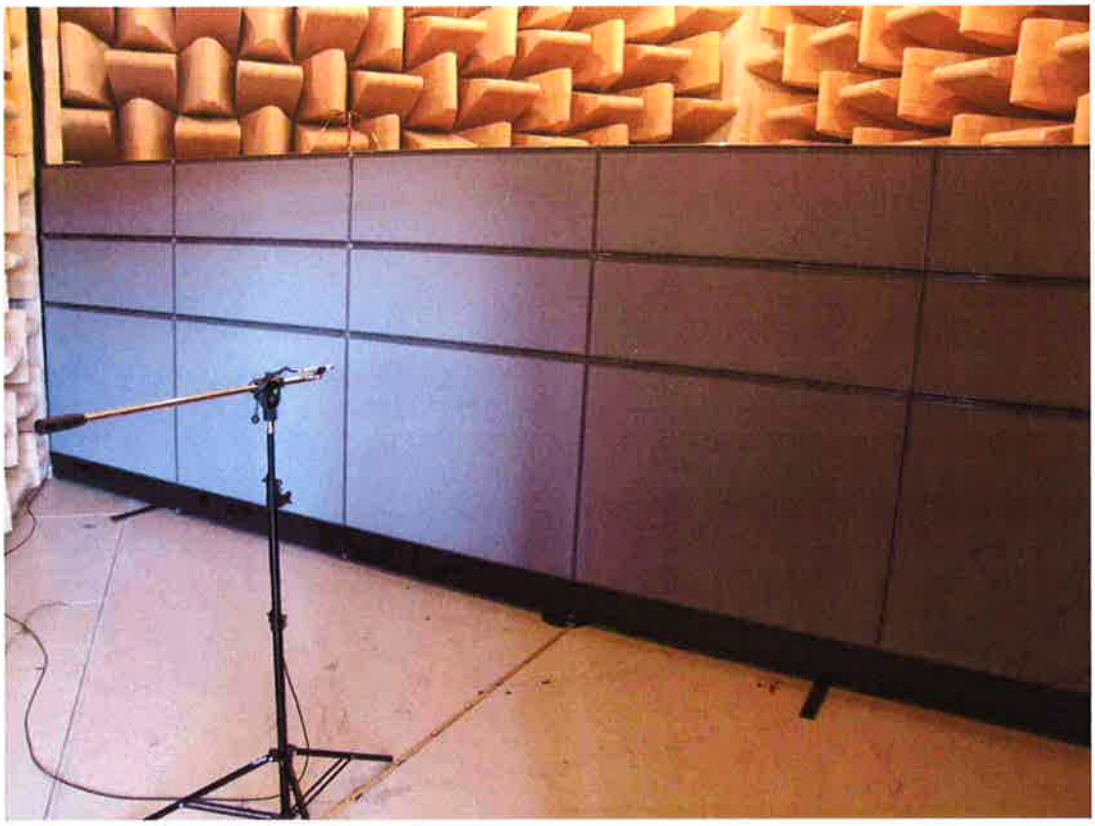
Appendices

Appendix 1

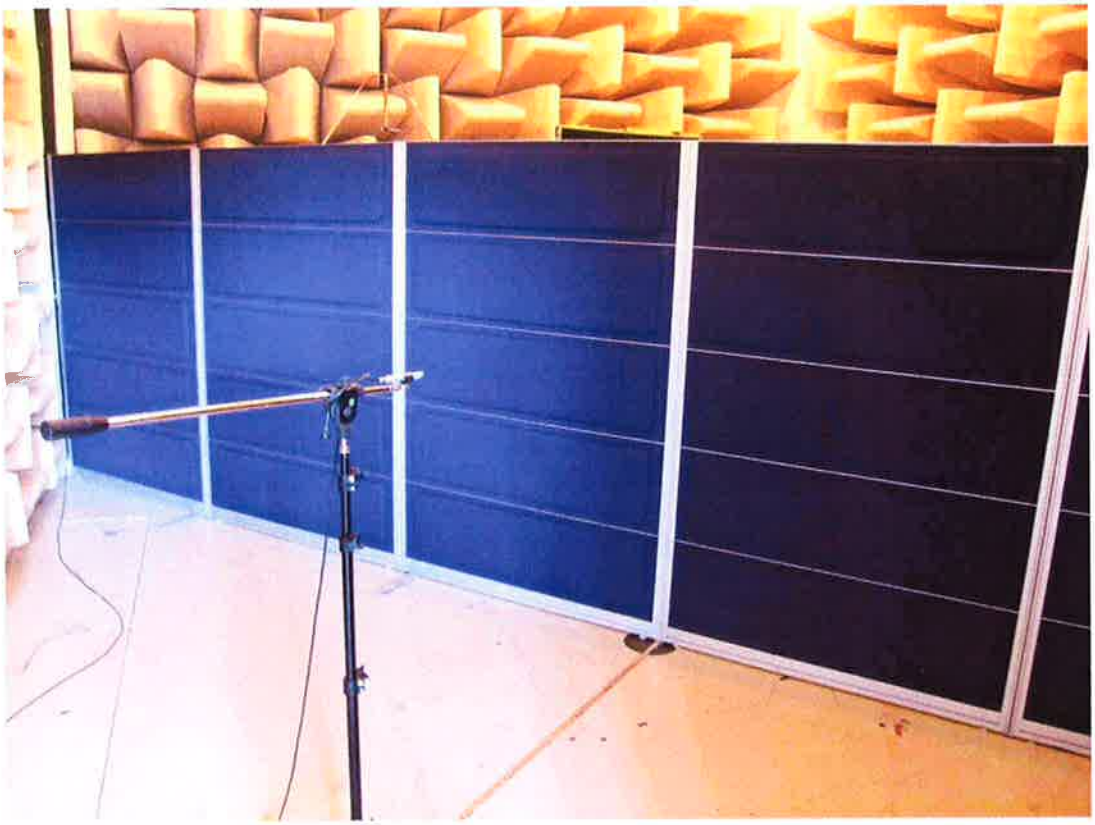
Setup of the test screens

The test screen type Zonit 80



Appendix 1

The test screen type Rezon with panel RZLA



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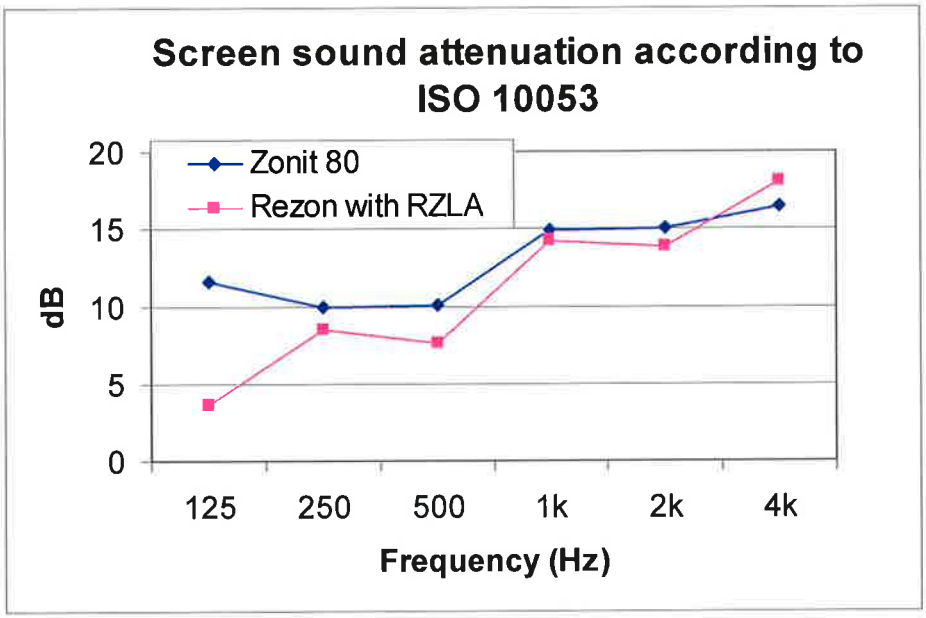
Result: Screen sound attenuation ΔL_S is shown in the diagram and table below.



Frequency (Hz)	Zonit 80	Rezon with panel RZLA
	ΔL_S (dB)	ΔL_S (dB)
125	12	4
250	10	9
500	10	8
1000	15	14
2000	15	14
4000	16	18
$\Delta L_{S,w}$	14	13
Class	B	B