SRL

Technical Report

81627-SRL-RP-XT-007-P1

Project

The Laboratory Measurement of Speech Level Reduction of a Syneo Silence Studio Pod

Prepared for

Spacemann Ltd

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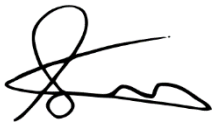
Checker	Allen Smalls Quality Manager	
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Version History

Version	Date	Comments
P1	05/03/2024	

Contents

1.0 Description of Test

Tests have been done in SRL's Laboratory at Holbrook House, Sudbury, Suffolk, to determine the speech level reduction of a meeting pod generally to BS ISO 23351-1:2020.

The results are given in octave bands over the frequency range 125Hz to 8kHz.

1.1 Description of Sample

A Syneo Silence Studio Pod with nominal dimensions of 1100x1350x2350mm was assembled and then tested.

Please refer to Drawing 1 for general test set up.

Sampling plan:	Enough for test only
Sample condition:	New
Details supplied by:	Spacemann Ltd
Sample installed by:	Spacemann Ltd

1.2 Sample Delivery Date

5 March 2024

1.3 Test Procedures

The sample was mounted/located and tested in accordance with the relevant standard. The details of measurements are given in Appendix A. The method and procedure are described in Appendix B.

2.0 Results

The results of the measurements and subsequent analysis are given in Table 1.

Results relate only to the items as received and tested.

Table 1

Table 1

Test reference: 1 Test date: 05/03/2024

Description: Syneo Silence Studio Pod, 1100x1350mm

Frequency Hz	Level reduction, dB
125	15.0
250	19.9
500	26.6
1000	27.3
2000	27.7
4000	29.0
8000	29.9
Speech level reduction $D_{S,A}$	**25.6**

Air temperature	15.5	°C
Relative humidity	57	%RH
Static pressure	1004	mbar

Classification of enclosure according to speech level reduction, $D_{S,A}$ from Table D.1 in Annex A of BS ISO 23351-1:2020	
Class	**B**

Drawing 1 – Syneo Silence Studio Pod

Appendix A - Details of Measurements

A1. Location

SRL Technical Services (Sound Research Laboratories)

Holbrook House

Little Waldingfield

Sudbury

Suffolk

CO10 0TF

Tel: 01787 247595

A2. Test Date

5 March 2024

A3. Tester

Richard Calvert of SRL Technical Services Limited

A4. Instrumentation and Apparatus Used

Make	Description	Type
Abtronix	Microphone Multiplexer	
EDI	Microphone Power Supply Unit	
Norwegian Electronics	Multichannel Sound Level Meter	Nor850
Brüel & Kjaer	Windshields	UA0237

Make	Description	Type
Brüel & Kjaer	Pre Amplifiers	2669C
Brüel & Kjaer	Microphone Calibrator	4231
Brüel & Kjaer	Omnipower Sound Source	4296
Larson Davis	12mm Condenser Microphone	2560, 377A60
Oregon Scientific	Temperature & Humidity & Probe	THGR810
TOA	Graphic Equalizer	E-1231
Crown	Power Amplifier	1502
G.R.A.S	Pre Amplifier	26AK
G.R.A.S	Microphone	40AR

A5. References

BS ISO 23351-1:2020 Acoustics – Measurement of speech level reduction of furniture ensembles and enclosures.

Appendix B – Test Procedure

The Laboratory Determination of Speech Level Reduction

The speech level reduction is calculated from the difference in sound power emissions of a noise source before and after the test sample is placed around the noise source.

In the laboratory, sound power emission is determined from the corrected sound pressure level measured in a reverberation room where the noise source is operated.

The main reverberation room is constructed from 215mm brick which is internally plastered, with a reinforced concrete floor and roof. The room has a volume of 300 cubic metres and is isolated by the use of resilient mountings and seals from the surrounding structure ensuring good acoustic isolation.

With the noise source operating in the required mode, the resulting sound pressure levels in the reverberation room are sampled, filtered into one-third octave band widths, integrated and averaged by means of a Real Time Analyser using a spaced array of microphones. The value obtained at any particular frequency is then corrected into Sound Power Levels using the expression:

$$L_w = \overline{L_{p(ST)}} + \left\{10lg\frac{A}{A_0} + 4.34\frac{A}{S} + 10lg\left(1+\frac{Sc}{8Vf}\right) + C_1 + C_2 - 6\right\} dB$$

where

L_w is the sound power level of the sound source under test (dB);

$\overline{L_{p(ST)}}$ is the average sound pressure level in the room (dB);

A is the equivalent absorption area of the room (m^2);

A_0 = $1 m^2$

S is the total surface area of the reverberation room (m^2);

V is the volume of the room (m^3);

f is the midband frequency of measurement (Hz);

c is the speed of sound at temperature θ

c=$20.05\sqrt{273+\theta}$ m/s

θ is the temperature (°C)

$$C_1 = -10\ lg \frac{p_s}{p_{s,0}} + 5\ lg \left(\frac{273.15+\theta}{\theta_0}\right)\ dB$$

$$C_2 = -10\ lg \frac{p_s}{p_{s,0}} + 15\ lg \left(\frac{273.15+\theta}{\theta_1}\right)\ dB$$

p_s is the static pressure, in kilopascals, in the test room at the time of the test.

$p_{s,0}$ is the reference static pressure, 101.325 kPa.

θ is the air temperature in degrees Celsius, in the test room at the time of the test.

θ_0 = 314 K.

θ_1 = 296 K

Once this is completed the test sample is put in position round the noise source and the measurements repeated. This is repeated for two noise source positions.

The reported level reduction is the arithmetic average of the position-specific level reduction values.

The Speech Level Reduction, $D_{S,A}$ is then calculated according to section 5.3 of BS ISO 23351-1 and the class rating according to Table D.1 of the standard.

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