SRL

Technical Report
81627-SRL-RP-XT-010-P1

Project

The Laboratory Measurement of Speech Level Reduction of Office Pods

Prepared for

Spacemann Ltd

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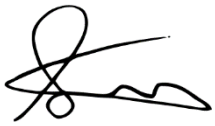
Checker	Allen Smalls Quality Manager	
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Version History

Version	Date	Comments
P1	23/04/2024	

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 - Team Pod with nominal dimensions of 1300(W)x2200(L)x2300(H)mm 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 April 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

Test reference: 1 Test date: 05/04/2024

Description: Syneo Silence - Team Pod, 1300x 2200x2300mm

Frequency Hz	Level reduction, dB
125	17.4
250	21.1
500	24.3
1000	28.6
2000	32.1
4000	41.7
8000	48.8
Speech level reduction $D_{S,A}$	**25.1**

Air temperature	16.9	°C
Relative humidity	60	%RH
Static pressure	992	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 Team 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 Dates

5 April 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
Easylog	Temperature & Humidity Probe	EL-WIFI-TH
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.

Acoustics
Air Quality
Carbon & Net Zero
Lab & Site Testing
Monitoring
Noise & Vibration
Odour & Dust
Sustainability

The services listed below are services which SRL can offer. They are not covered by our UKAS accreditation except for some of our Lab and site testing. For further details please contact us directly.

Acoustics

Since 1967, our team of acoustic consultants has played a key role in major projects where noise or vibration is an issue, in the UK and across the globe – whether it's planning, performance prediction, design, inspection, troubleshooting, measurement or commissioning.

Air Quality

We offer a comprehensive service to model, monitor and analyse air quality, delivering assessments for a broad range of projects and purposes, for both private and public sector clients.

Carbon & Net Zero

Top of the agenda is tackling energy and carbon reduction to limit the impact of climate change. Our team of consultants will help you to achieve your sustainability objectives.

Lab & Site Testing

Design based on test data will always achieve the best results – and that's why we offer a wide range of acoustic testing at our independently accredited laboratories, as well as on-site testing to support live projects.

Monitoring

Our specialist services to monitor and assess noise, vibration, dust, air quality and odour employ the latest technology to provide remote access to data, helping to address issues quickly and to protect our clients.

Noise & Vibration

Ensuring noise and vibration does not exceed agreed levels is an important part of our environmental management services, using state-of-the-art technology to access real-time data remotely, to enable swift remedial action if required.

Odour & Dust

As part of our portfolio of environmental monitoring services, we offer specialist advice on the adverse impact of dust and odour across a range of projects including construction, waste handling and mineral extraction.

Sustainability

Minimising the impact on the environment is at the centre of today's business objectives. Our specialist services help our clients to fulfil their obligations, whether it's a BREEAM assessment, Energy Carbon Reduction or Net Zero.