



Technical Report

81627-SRL-RP-XT-002-PI

Project

The Laboratory Measurement of Speech
Level Reduction of a Syneo Silence Phone
Booth

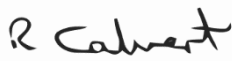
Prepared for

Spacemann Ltd

Published

31 January 2024

This report shall not be reproduced, except in full,
without written approval of SRL Technical Services Ltd

Quality Assurance		
Project Title	The Laboratory Measurement of Speech Level Reduction of a Syneo Silence Phone Booth	
Document Title	Laboratory Test Report	
Client	Spacemann Ltd	
Client Address	I Homefield Road Haverhill Suffolk CB9 8QP	
Author	Richard Calvert Tester rcalvert@srltsl.com	
Checker	Allen Smalls Quality Manager	
Report Number	81627-SRL-RP-XT-002-PI	

Version History

Version	Date	Comments
PI	31/01/2024	



This report shall not be reproduced, except in full,
without written approval of SRL Technical Services Ltd

Contents

1.0	Description of Test.....	4
2.0	Results.....	5
	Table I	6
	Drawing I – Syneo Silence Phone Booth.....	7
	Appendix A - Details of Measurements.....	8
	Appendix B – Test Procedure	10

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 Phone Booth with nominal dimensions of 1100x1100x2350mm 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

3 January 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.



This report shall not be reproduced, except in full,
without written approval of SRL Technical Services Ltd

2.0 Results

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

Results relate only to the items as received and tested.

This report shall not be reproduced, except in full,
without written approval of SRL Technical Services Ltd

Table 1

Test reference: 1

Test date: 03/01/2024

Description: 1100x1100 pod, Speaker Two - Door Seals workings, Top far

Frequency Hz	Level reduction, dB
125	15.2
250	23.6
500	25.9
1000	28.9
2000	27.9
4000	34.4
8000	37.6
Speech level reduction $D_{S,A}$	26.3

Air temperature	12.2	°C
Relative humidity	68	%RH
Static pressure	980	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 Phone Booth



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

3 January 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

This report shall not be reproduced, except in full,
without written approval of SRL Technical Services Ltd

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	I502
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:

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

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 (m²);

$A_0 = 1 \text{ m}^2$

S is the total surface area of the reverberation room (m²);

V is the volume of the room (m³);

f is the midband frequency of measurement (Hz);

c is the speed of sound at temperature θ

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

θ is the temperature ($^{\circ}\text{C}$)

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

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

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.

$\theta_0 = 314 \text{ K}$.

$\theta_1 = 296 \text{ K}$

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

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.