Technical Report

81350-SRL-RP-XT-001-P1

Project

The Laboratory Measurement of Speech Level Reduction of a Meeting Pod

Prepared for

The Meeting Pod Company Ltd

By

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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 standard specification meeting pod was assembled and then tested.

Please refer to Drawings 1 & 2, Picture 1 and Photographs 1 & 2 for general test set up.

Sampling plan:	Enough for test only
Sample condition:	New
Details supplied by:	The Meeting Pod Company Ltd
Sample installed by:	The Meeting Pod Company Ltd

1.2 Sample Delivery Date

28 June 2023

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

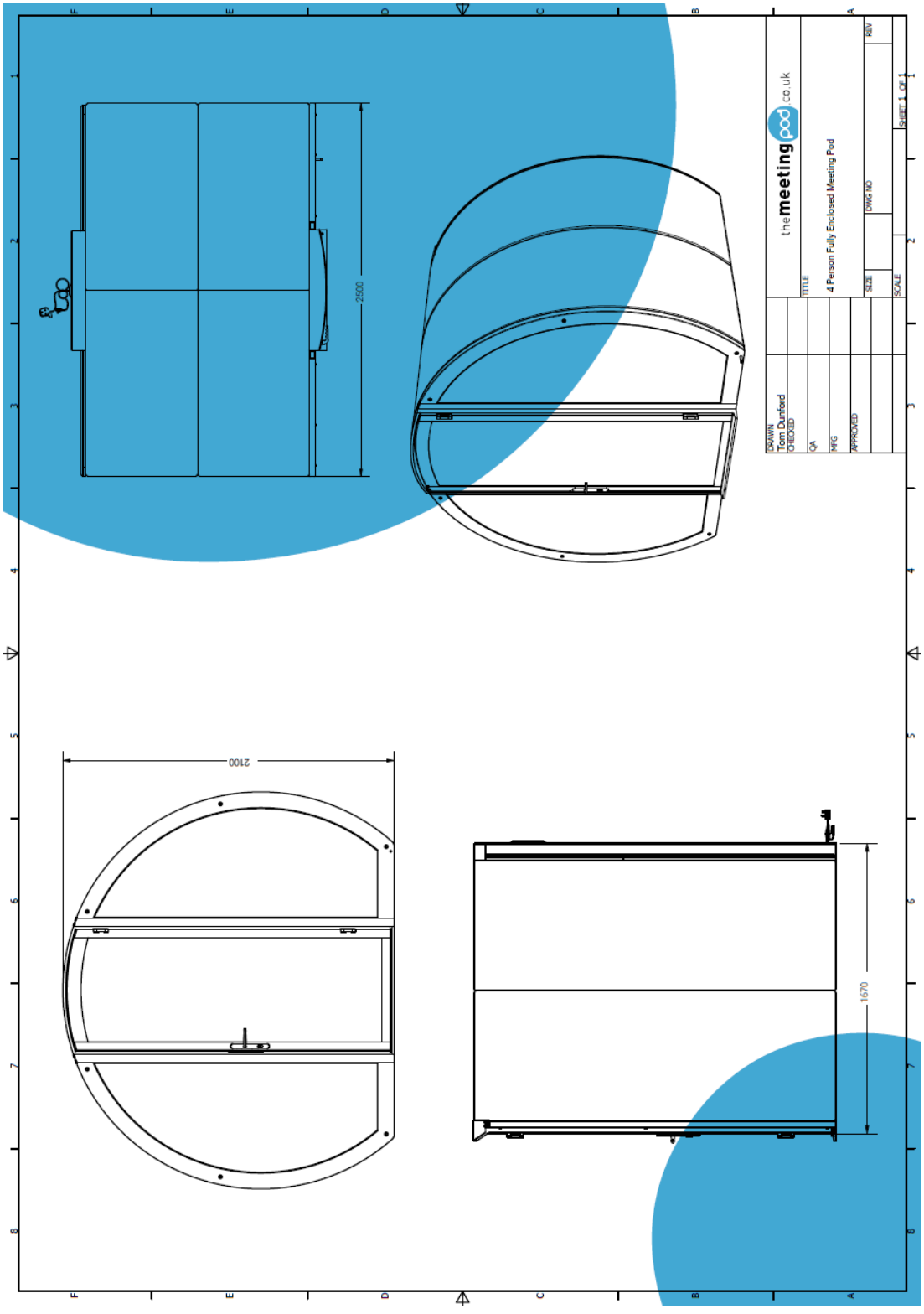
Frequency Hz	Level Reduction, dB
125	20.9
250	18.6
500	26.4
1000	32.2
2000	35.5
4000	35.2
8000	41.0
Speech Level Reduction $D_{S,A}$	**26.1**

Static Pressure	1010	mbar
Relative Air Humidity	68	% RH
Air Temperature	21.1	°C

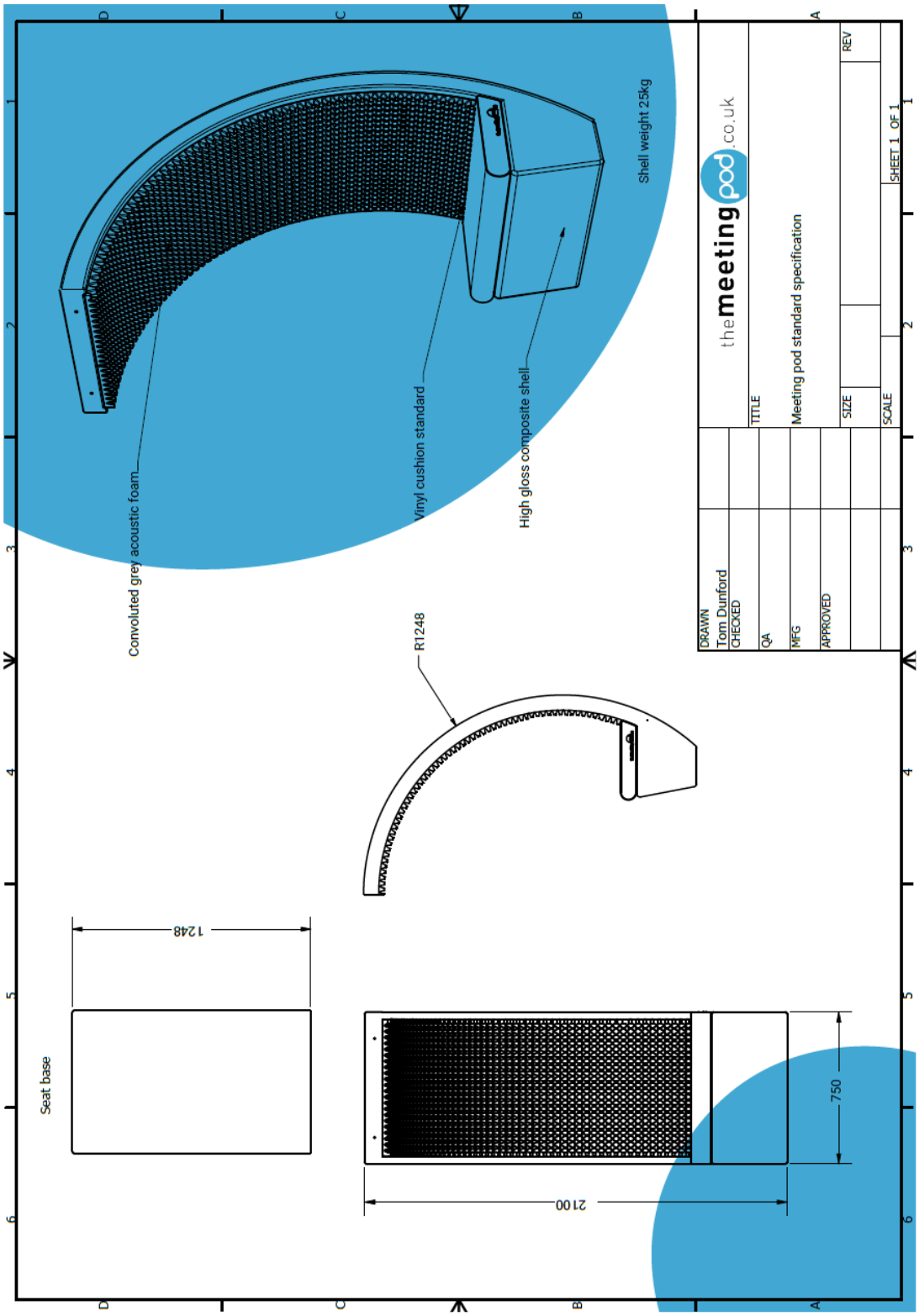
Classification of enclosure according to speech level reduction, $D_{S,A}$ from Table D.1 in Annex A of BS ISO 23351-1:2020

Class B

Drawing 1 – Fully enclosed Meeting Pod



Drawing 2 – Meeting Pod Section (Standard Specification)



Picture 1 – Meeting Pod

Photograph 1 – Meeting Pod being assembled

Photograph 2 – Meeting Pod with noise source located inside

Appendix A - Details of Measurements

A1. Location

Sound Research Laboratories

Holbrook House

Little Waldingfield

Sudbury

Suffolk

CO10 0TF

A2. Test Date

28 June 2023

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
	Pre Amplifiers	2669C

	Microphone Calibrator	4231
	Omnipower Sound Source	4296
Larson Davis	12mm Condenser Microphone	2560, 377A60
Oregon Scientific	Temperature & Humidity & Probe	THGR810
TOA	Graphic Equalizer	E-1231
QSC Audio	Power Amplifier	RMX 1450
G.R.A.S	Pre Amplifier	26AK
	12mm Condenser 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 place 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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