SRL

UKAS TESTING
0444

Technical Report
83155-SRL-RP-XT-001-P1

Project

The Laboratory Measurement of The Random Incidence Sound Absorption Coefficient of Various Acoustic Wall and Ceiling Panels

Prepared for

Siderise (Special Products) Limited

Published

4 March 2026

0444

Quality Assurance		
Project Title	The Laboratory Measurement of The Random Incidence Sound Absorption Coefficient of Various Acoustic Wall and Ceiling Panels	
Document Title	Laboratory Test Report	
Client	Siderise (Special Products) Limited	
Client Address	Lady Lane Industrial Estate Hadleigh Ipswich Suffolk IP7 6BQ	
Author	Kieron Farrow Tester kfarrow@srltsl.com	
Checker	Allen Smalls Quality Manager	
Report Number	83155-SRL-RP-XT-001-P1	

Version History

Version	Date	Comments
P1	04/03/2026	

0444

Contents

0444

1.0 Description of Test

Tests have been done in the large reverberation chamber at SRL's Laboratory at Holbrook House, Sudbury, Suffolk, to determine the random incidence sound absorption coefficient of various acoustic wall and ceiling panels in accordance with BS EN ISO 354:2003 and the single number rating in accordance with BS EN ISO 11654:1997.

The results are given in 1/3rd octave bands over the frequency range 50Hz to 10kHz, which is beyond that required by the test standard. Measurements outside the standard frequency range (i.e. <100Hz and >5000Hz) are not UKAS accredited.

1.1 Description of Sample

Various acoustic wall and ceiling panels were tested. See Section 2.0 and Test Certificates 20181 to 20184 for more details.

Sampling plan:	Selected at Random
Sample condition:	New
Details supplied by:	Siderise (Special Products) Ltd
Sample installed by:	Siderise (Special Products) Ltd and SRL Technical Services Ltd
Sample delivery dates:	09 & 10 December 2025

1.2 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. The measurement uncertainty is given in Appendix C.

2.0 Results

The results of the measurements and subsequent analysis are given in Test Certificates 20181 to 20184 and summarised below.

Results relate only to the items as received and tested.

BS EN ISO 354:2003 describes various test specimen mountings. The methods of mounting used for these tests are briefly described as follows:

Type A Mounting

Test specimen placed directly against a room surface. The specimen may be held in place with adhesive or mechanical fasteners providing there is no resulting air space between the specimen and room surface.

SRL Test/ Certificate No.	Description in Brief	Mounting Method	α_w
1 20181	ALS-25 (25mm Thick)	A	0.55(MH)
2 20182	ALS-50 (50mm Thick)	A	1.00
3 20183	ALS-75 (75mm Thick)	A	1.00
4 20184	ALS-100 (100mm Thick)	A	1.00

Shape indicators, L, M, H, (low, medium, high) show the frequencies at which the practical sound absorption coefficient exceeds the shifted reference curve by 0.25 or more.

Appendix A - Details of Measurements

A1. Location

The large reverberation chamber

SRL Technical Services (Sound Research Laboratories)

Holbrook House

Little Waldingfield

Sudbury

Suffolk

CO10 0TF

Tel: 01787 247595

A2. Test Date

11 December 2025

A3. Tester

Kieron Farrow 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-MF1

Make	Description	Type
Brüel & Kjaer	Windshields	UA0237
Brüel & Kjaer	Pre Amplifiers	2669C
Brüel & Kjaer	Microphone Calibrator	4231
Brüel & Kjaer	Omnipower Sound Source	4296
Larson Davis	12mm Condenser Microphone	2560, 377A60
Testo	Temperature & Humidity Probe	605-H1
Oregon Scientific	Barometer	WMR86
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 EN ISO 354:2003 — Measurement of sound absorption in a reverberation room.

BS EN ISO 11654:1997 — Sound absorbers for use in buildings. Rating of sound absorption.

ATSM C423-01 — Sound Absorption and sound Absorption Coefficients by the Reverberation Room Method.

Appendix B – Test Procedure

Measurements of Random Incidence Sound Absorption Coefficients to BS EN ISO 354:2003 - TP14 (Plane Absorbers)

In the laboratory, random incidence sound absorption coefficients are determined from the rate of decay of a sound field in a reverberation room, with and without a test sample installed. The rate of decay is described by the time a sound field takes to decay by 60dB, known as the reverberation time.

The reverberation room is constructed from 215mm brick, which is internally plastered with a reinforced concrete roof and floor. The reverberation room is rectangular, measuring 8.3 metres long, 6.7 metres wide, 5.4 metres high. The volume is 300m^3, the total surface area, 275m^2. 10 randomly positioned diffusers hang from the ceiling with a total surface area (for one side) of 20m^2. The room is isolated from the surrounding structure by resilient mountings and seals, ensuring good acoustic isolation.

Using at least two omnidirectional loudspeaker positions, broad band random noise is produced in the room using an electronic generator and power amplifier. When the amplification system is switched off, the decay of sound is filtered into one-third octave band widths and the reverberation times measured. This process is repeated for six microphone positions and the values arithmetically averaged to obtain a final value for each frequency.

The sample, which has an area between 10m^2 and 15.7m^2 and have a length to width ratio of between 0.7 and 1.0, is then laid directly on the floor of the reverberation room so that no part of it is closer than one metre from any edge of the boundaries. The procedure of measuring the reverberation times is then repeated.

The sound absorption coefficients are calculated from the difference in decay rates for each frequency according to the formula:

$$a_s = \frac{A_T}{S}$$

where

a_s	is the random incidence absorption coefficient
A_T	is the increase in equivalent sound absorption area of the test specimen (m^2)
S	is the area covered by the test specimen (m^2)

The equivalent absorption area of the test specimen is further defined as:

$$A_T = 55.3V\left(\frac{1}{c_2 T_2} - \frac{1}{c_1 T_1}\right) - 4V(m_2 - m_1)$$

where

V	is the volume of the empty reverberation room (m^3)
c_1	is the speed of sound in the empty room (m/sec)
T_1	is the reverberation time in the empty room (sec)
m_1	is the power attenuation coefficient calculated according to ISO 9613-1 using the climatic conditions that have been present in the empty room during the measurement.

c_2, T_2 and m_2 have the same meanings as c_1, T_1 and m_1 but with the test specimen in the room.

It is occasionally found that the absorption coefficient derived in this manner reaches a value greater than 1.0 implying that the sample absorbs more sound energy than is generated. This is clearly impossible and investigation has shown that this anomaly is due to diffraction of the impinging sound waves at the edges of the sample. In practical terms this is insignificant.

0444

Appendix C – Measurement Uncertainty

This Appendix gives the measurement uncertainties for the various sound absorption test measurements. The measurement uncertainties have been calculated in accordance with BS EN ISO 12999-2:2020 and based on reproducibility conditions with a coverage factor of k=2.

Weighted sound absorption coefficient, α_w, (according to BS EN ISO 11654)
Expanded measurement uncertainty ±0.07

1/3 octave band sound absorption coefficient measurements, α_s and α_{NRD}

Measured sound absorption coefficient, α_s										
0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00

f, Hz	Expanded uncertainties ±U. Derived from BS EN ISO 12999-2:2020 based on reproducibility conditions and a coverage factor of k=2										
100	0.03	0.08	0.13	0.17	0.22	0.27	0.32	0.37	0.41	0.46	0.51
125	0.03	0.07	0.10	0.14	0.17	0.21	0.25	0.28	0.32	0.35	0.39
160	0.03	0.06	0.09	0.11	0.14	0.17	0.20	0.23	0.25	0.28	0.31
200	0.03	0.05	0.07	0.10	0.12	0.14	0.16	0.18	0.21	0.23	0.25
250	0.03	0.05	0.07	0.08	0.10	0.12	0.14	0.16	0.17	0.19	0.21
315	0.03	0.05	0.06	0.08	0.09	0.11	0.12	0.14	0.15	0.17	0.18
400	0.03	0.04	0.05	0.07	0.08	0.09	0.10	0.11	0.13	0.14	0.15
500	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13
630	0.03	0.04	0.05	0.06	0.07	0.08	0.08	0.09	0.10	0.11	0.12
800	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.09	0.09	0.10	0.11
1000	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.09	0.09	0.10	0.11
1250	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.10	0.10	0.11
1600	0.04	0.04	0.05	0.05	0.06	0.07	0.07	0.08	0.08	0.09	0.10
2000	0.04	0.05	0.06	0.06	0.07	0.08	0.08	0.09	0.10	0.11	0.11
2500	0.05	0.06	0.06	0.07	0.08	0.08	0.09	0.09	0.10	0.11	0.11
3150	0.06	0.07	0.08	0.08	0.09	0.09	0.10	0.11	0.11	0.12	0.12
4000	0.08	0.09	0.09	0.10	0.10	0.11	0.12	0.12	0.13	0.13	0.14
5000	0.12	0.13	0.13	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.17

0444

Practical sound absorption coefficient measurements, α_p

Measured practical sound absorption coefficient, α_p										
0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00

f, Hz	Expanded uncertainties ±U. Derived from BS EN ISO 12999-2:2020 based on reproducibility conditions and a coverage factor of k=2										
125	n/a										
250	0.03	0.04	0.06	0.07	0.08	0.09	0.10	0.11	0.13	0.14	0.15
500	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
1000	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
2000	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
4000	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10

0444

Equivalent sound absorption area of the test specimen, A_T

Measured equivalent sound absorption area, A_T, m^2										
0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0

f, Hz	Expanded uncertainties ±U. Derived from BS EN ISO 12999-2:2020 based on reproducibility conditions and a coverage factor of k=2										
100	0.3	0.8	1.3	1.7	2.2	2.7	3.2	3.7	4.1	4.6	5.1
125	0.3	0.7	1.0	1.4	1.7	2.1	2.5	2.8	3.2	3.5	3.9
160	0.3	0.6	0.9	1.1	1.4	1.7	2.0	2.3	2.5	2.8	3.1
200	0.3	0.5	0.7	1.0	1.2	1.4	1.6	1.8	2.1	2.3	2.5
250	0.3	0.5	0.7	0.8	1.0	1.2	1.4	1.6	1.7	1.9	2.1
315	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	1.5	1.7	1.8
400	0.3	0.4	0.5	0.7	0.8	0.9	1.0	1.1	1.3	1.4	1.5
500	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3
630	0.3	0.4	0.5	0.6	0.7	0.8	0.8	0.9	1.0	1.1	1.2
800	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	0.9	1.0	1.1
1000	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	0.9	1.0	1.1
1250	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.0	1.1
1600	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.8	0.9	1.0
2000	0.4	0.5	0.6	0.6	0.7	0.8	0.8	0.9	1.0	1.1	1.1
2500	0.5	0.6	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.1	1.1
3150	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.2
4000	0.8	0.9	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.3	1.4
5000	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.6	1.7	1.7

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.