SRL

UKAS TESTING
0444

Technical Report
C/24166/T01

Project

The Laboratory Measurement of Airborne Sound Insulation of a Barrier Mat Material

Prepared for

Siderise (Special Products) Ltd

By

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Quality Assurance

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Summary

Tests have been done in SRL's Laboratory at Holbrook House, Sudbury, Suffolk, to determine the sound reduction index of a barrier mat material in accordance with BS EN ISO 10140-2:2010.

From these measurements, the required results have been derived and are presented in both tabular and graphic form in Data Sheet 1.

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 are not UKAS accredited.

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Allen Smalls
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Contents

1.0 Details of Measurements

1.1 Location

Sound Research Laboratories

Holbrook House

Little Waldingfield

Sudbury

Suffolk

CO10 0TF

1.2 Test Date

10 August 2018

1.3 Tester

Richard Calvert of SRL Technical Services Limited

1.4 Instrumentation and Apparatus Used

Make	Description	Type
E D I	Microphone Multiplexer	
	Microphone Power Supply Unit	
Norwegian Electronics	Real Time Analyser	830
	Rotating Microphone Boom	231

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

1.5 References

BS EN ISO 717-1:2013	Rating of sound insulation in buildings and of building elements. Airborne Sound Insulation.
BS EN ISO 10140-2:2010	Laboratory measurement of sound insulation for building elements – Part 2: Measurement of airborne sound insulation.

2.0 Description of Test

2.1 Description of Sample

A barrier mat material was tested. See Results section 3 and Drawing 1 for details of the test.

Sampling plan:	Selected at random
Sample condition:	New
Details supplied by:	Siderise (Special Products) Ltd
Sample installed by:	SRL Technical Services Ltd

2.2 Sample Delivery date

9 August 2018

2.3 Test Procedures

The sample was mounted/located and tested in accordance with the relevant standard. The method and procedure are described in Appendix A. The measurement uncertainty is given in Appendix B.

3.0 Results

The results of the measurements and subsequent analysis are given in Data Sheet 1 and summarised below.

Results relate only to the items tested.

Test No:	Information	R_w ($C;C_{tr}$)
2	Siderise NRB 0030, 2mm thick	23 (-1;-4)

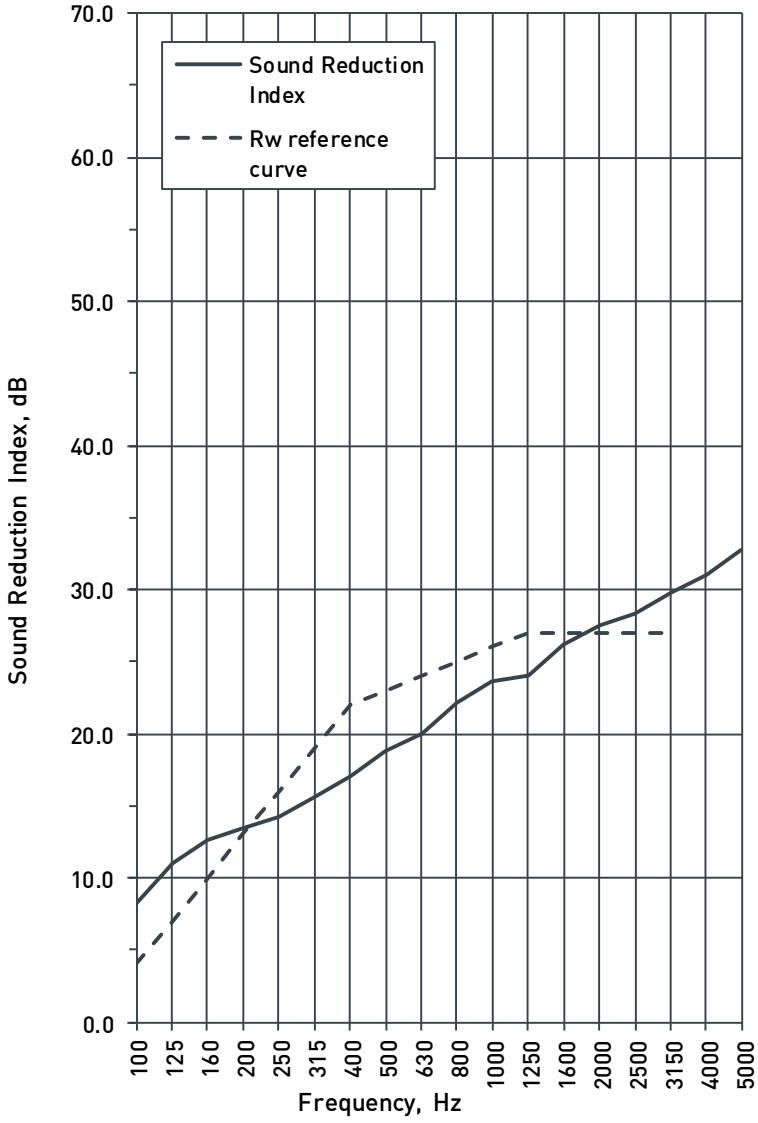
Data Sheet 1

Test Number:	2
Client:	Siderise Ltd
Test Date:	10/08/2018
Sample Height:	2.2 m
Sample Width:	2 m
Sample Weight:	3.84 kg/m²

Test Room:	**Source**	**Receiving**
Air Temperature:	20.1 °C	19.9 °C
Air Humidity:	61 %	61 %
Volume:	115 m³	300 m³
Air Pressure:	1009 mbar	

Product Identification: Siderise NRB 0030, 2mm thick

Freq, f Hz	Sound Reduction Index, dB	
	⅓ Oct	Octave
50+	11.5	9.7
63+	10.3	
80+	8.1	
100	8.2	10.3
125	11.1	
160	12.6	
200	13.5	14.4
250	14.3	
315	15.6	
400	17.1	18.5
500	18.8	
630	20.0	
800	22.2	23.2
1000	23.6	
1250	24.1	
1600	26.2	27.3
2000	27.5	
2500	28.4	
3150	29.8	31.1
4000	31.0	
5000	32.8	
6300+	35.6	35.2
8000+	35.9	
10000+	34.4	
Average 100-3150	19.6	Version v3.0



Rating according to BS EN ISO 717-1:2013

$R_w(C;C_{tr})$= **23 (-1 ; -4) dB**

* shows measurement corrected for background

> shows measurement limited by background

\+ shows Frequency beyond standard and not UKAS accredited

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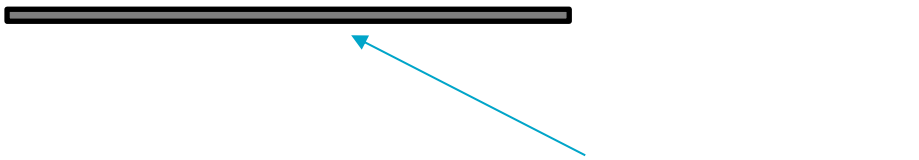
Drawing 1



Appendix A - Test procedure

Measurement of Sound Transmission in accordance with

BS EN ISO 10140-2: 2010 – TP33

In the laboratory, airborne sound transmission is determined from the difference in sound pressure levels measured across a test sample installed between two reverberant rooms. The difference in measured sound pressure levels is corrected for the amount of absorption in the receiving room. The test is done under conditions which restrict the transmission of sound by paths other than directly through the sample. The source sound field is randomly incident on the sample.

The test sample is located and sealed in an aperture within the brick dividing wall between the two rectangular reverberant or acoustically "live" rooms, both of which are constructed from 215mm brick with reinforced concrete floors and roofs. The brick wall has dimensions of 3.9m wide x 2.9m high and forms the whole of the common area between the two rooms

One of the rooms is used as the receiving room and has a volume of 300 cubic metres. It is isolated from the surrounding structure and the adjoining room by the use of resilient mountings and seals ensuring good acoustic isolation. The adjoining source room has a volume of 115 cubic metres.

Broad band noise is produced in the source room from an electronic generator, power amplifier and loudspeaker. The resulting sound pressure levels in both rooms are sampled using a microphone mounted on an oscillating boom and connected to a real-time analyser. The signal is filtered into one third octave band widths, integrated and averaged. The value obtained at each frequency is known as the average sound pressure level for either the source or the receiving room. The change in level across the test sample is termed the sound pressure level difference, i.e.

$$D = L_1 - L_2$$

where

D is the equivalent Sound Pressure level difference in dB

L_1 is the equivalent Sound Pressure level in the source room in dB

L_2 is the equivalent Sound Pressure level in the receiving room in dB

The Sound Reduction Index (R), also known by the American terminology Sound Transmission Loss, is defined as the number of decibels by which sound energy randomly incident on the test sample is reduced in transmitting through it and is given by the formula:

$$R = D + 10\log 10 \frac{S}{A} \text{..... in decibels}$$

where

S is the area of the sample

A is the total absorption in the receiving room

both dimensions being in consistent units

The Sound Reduction Index is an expression of the laboratory sound transmission performance of a particular element or construction. It is a function of the mass, thickness, sealing method of mounting etc., and is independent of the overall area of the sample.

However, when an example of this construction is installed on site, the sound insulation obtained will depend upon its surface area, as well as the absorption in the receiving room. The larger the area the greater the sound energy transmitted. Also, the overall sound insulation is affected by the sound transmission through other building elements, some of which may have an inferior performance to the sample tested. In practice, therefore, the potential sound reduction index of a construction is not fully realised on site. Furthermore, the sound reduction index of a particular sample of that construction can only be measured accurately in a laboratory, because only under such controlled conditions can the sound transmission path be limited to the sample under test.

R_w, C and C_{tr} have been calculated in accordance with the relevant section of

BS EN ISO 717-1:2013 from the results of laboratory tests carried out in accordance with

BS EN ISO 10140-2:2010.

Appendix B – Measurement Uncertainty

BS EN ISO 10140-2: 2010 – TP33

The following values of uncertainty are based on a standard uncertainty multiplied by a coverage factor of k = 2, which provides a level of confidence of approximately 95%.

Frequency, Hz	Uncertainty, ± dB
100	3.2
125	2.9
160	2.5
200	2.5
250	1.8
315	1.8
400	1.5
500	1.5
630	1.2
800	1.2
1000	1.2
1250	1.2
1600	1.2
2000	1.2
2500	1.2
3150	1.0

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SRL offers services in:
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