

SOUND INSULATION TEST REPORT

Sound Insulation testing in accordance with Test Standard BS EN ISO 140-4

Report Reference Number: 29380

Report Date: 12/07/2023

Abstract

Sound Insulation Testing is the process of measuring how much noise a building element, normally a wall or a floor, stops from travelling through to a neighbouring property.

This report describes the process taken and the results obtained from the sound insulation testing at 4 Crescent Road, Worthing, BN11 1RL.

Competent Tester

Testing was conducted by James Van Brummen who is a member of the SITMA Sound Insulation Testing Registered Testers Scheme, Registration Number: 7307

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The SITMA Registered Testers' Scheme

This report was conducted by a tester that is registered with the SITMA Registered Testers' Scheme for Sound Insulation Testers. More information on the scheme, the lodgement system, quality control and auditing are discussed below.

Scheme Member Conducting this test

The tester that conducted your testing was:	James Van Brummen
Linked to:	Winthorpe Management Systems t/a WMS, 40 Fortescue Road, , London, SW19 2EB.



Entry Requirements

In order to enter the SITMA Registered Testers' Scheme, testers are required to either:

- Have completed the Institute of Acoustics Certificate of Competence in Building Acoustics Measurements (CCBAM), or
- Have been assessed by SITMA to hold suitable, demonstrable evidence of competence in sound insulation testing

Audit Requirements

Each tester is audited at least twice a year, completely unannounced. This is achieved by the tester logging their job onto the SITMA portal **in advance of testing taking place.**
Audits are carried out by independent SITMA employees who have been trained in accordance with BS EN ISO 19011:2018 and have extensive background in Sound Insulation Testing.
Each tester will be able to issue you with their SITMA audit documentation from their last audit alongside this report, if requested.

SITMA Portal

The SITMA Portal, besides logging every job for every tester, is used to generate reports, just like this one. The portal does not take pre-calculated information, it takes the raw data from the sound level meter and calculates each individual test itself, before producing this report. This ensures that no test data has been amended by any tester prior to the information being uploaded.

SITMA Accreditation

SITMA will shortly have achieved BS EN ISO/IEC 17024:2012 accreditation from UKAS (Application number 10579). SITMA has completed the Initial Audit and is awaiting final confirmation.

Calibration Requirements

SITMA holds some of the strictest calibration requirements in the world for sound insulation testing, with each sound level meter and tapping machine requiring UKAS calibration every 2 years and the microphone calibrator requiring calibration every 12 months. If the tester does not hold correctly calibrated equipment, the SITMA portal will not let them produce this report.

Complaints

You should speak directly with the tester if you wish to make a complaint. If your complaint is not

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handled to your satisfaction, you are then welcome to make a complaint directly to the SITMA registered testers' scheme in line with our complaints process PUS013.

TO CHECK THIS REPORT IS VALID

1. Head to this site: https://sitma.bcta.group/
2. Use these credentials:
    a. Report Reference Number:
        i. 29380
    b. Job Postcode:
        i. BN11 1RL

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Simplified Test Results

Certificate Number	Plot & Source Room	Plot & Receive Room	Target $D_{nT,w}+C_{tr}$	Result $D_{nT,w}+C_{tr}$	Pass / Fail
121359	Unit 100-108 Montague Street Commercial Space	Flat Penthouse, 4 Crescent Road Bedroom 1	43	53	PASS
121360	Unit 100-108 Montague Street Commercial Space	Flat Penthouse, 4 Crescent Road Kitchen / Living Room	43	61	PASS

Testing Methodology

Airborne Sound Insulation Tests

Measurements of Standardised Level Difference (D_{nT}) were conducted in accordance with BS EN ISO 140-4:1998.

Level measurements in the Source & Receive Rooms (L_1 & L_2)

The noise was generated in the source room by placing an active loudspeaker, which produces a steady spectrum of pink noise, in an external corner of the room but at least 0.5m away from any reflective surface.

The noise level was measured in both the source room and receive room, sampling as much of the room as possible. The sound level meter was always kept 0.7m away from any reflective surface as to not artificially increase or decrease noise levels into the microphone.

The measurements were taken at one-third octave band intervals from 100 to 3150 Hertz using an average time of 30 seconds The speaker was then moved to a corner junction on two internal walls and the measurements were repeated. The measurements in each room were arithmetically averaged. For separating walls the speaker should be in a corner opposite the test wall.

Background Measurements in Receive Room (L_b)

Where noise levels were measured in the receive room, the background noise level was also measured with the source room speaker turned off to ensure the background noise level did not influence the result. The background noise level is measured over a time period that accurately reflects the background noise measurement at the time of the test. This is normally between 6 & 30 seconds and can vary between the first and second background measurements.

Reverberation Time Measurements (T_2, T_{20})

A minimum of 6 reverberation time measurements were also taken in the receive room to accurately define the level of influence the diffuse field has on the microphone, ensuring that an increase in soft or hard surfaces does not impact the overall test result.

A minimum of 6 reverberation times were measured in each room using a minimum of 3 microphone positions at each of 2 loudspeaker positions in accordance with BS EN ISO 354:2003 (also complies with BS EN 20354:1993)

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Calculation Methodology

Airborne Sound Insulation Tests

Background Noise Correction ('Corrected L_2')
Any receive room noise measurements that are within 6dB of the background measurements are corrected by logarithmically averaging the difference to correct the receive room measurement. The correction is applied up to 10dB, where a maximum correction of 1.6dB is applied. Any background noise level greater than 10dB over the L_2 measurement will appear to reduce the sound insulation at that frequency.

Level Difference ('*D*')
The difference between the source and 'corrected' receive room measurement is calculated for each speaker position and 2 differences averaged to obtain '*D*' for each frequency measured. These are calculated separately for Speaker Position 1 and Speaker Position 2

Standardised Level Difference ('D_{nT}')
The result is standardised by adding 10 times the logarithm of half the reverberation time at each frequency to give the standardized level difference (DnT) at each frequency. These are calculated separately for Speaker Position 1 and Speaker Position 2 and are arithmetically averaged to produce final $D_{nT,s}$.

Weighted Standardized Level Difference ('$D_{nT,w}$')
The $D_{nT,s}$ are then compared to the standard reference curve as defined in BS EN ISO 717-1:1997 to give a single figure result of $D_{nT,w}$.

Weighted Standardized Level Difference with Spectrum Adaption ('$D_{nT,w}$ + C;C_{tr}')
The spectrum adaptation terms (C;C_{tr}) are then calculated in accordance with BS EN ISO 717-1:1997.

Precision
All measurements are taken to 0.1dB precision, except reverberation times which are taken to 0.01 seconds precision.

Impact Sound Insulation Tests

Background Noise Correction ('Corrected L_2')
Any receive room noise measurements that are within 6dB of the background measurements are corrected by logarithmically averaging the difference to correct the receive room measurement. The correction is applied up to 10dB, where a maximum correction of 1.6dB is applied. Any background noise level greater than 10dB over the L_2 measurement will appear to reduce the sound insulation at that frequency.

Normalized Impact Sound Pressure Level ('L'_{nT}')
The result is normalized by adding 10 times the logarithm of half the reverberation time at each frequency to the 'corrected' L2 to give the Standardized Impact Sound Pressure Level (L'_{nT}) at each frequency.

Weighted Standardized Impact Sound Pressure Level ('$L'_{nT,w}$')
The $L'_{nT,w}$ are then compared to the standard reference curve as defined in BS EN ISO 717-2:1997 to give a single figure result.

Precision
All measurements are taken to 0.1dB precision, except reverberation times which are taken to 0.01 seconds precision.

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Sampling Regime

Testing was conducted using a sampling regime in accordance with Approved Document E 2003 [as amended] (ADE), ensuring each construction type was tested on the project, not necessarily each plot.
It is assumed that each construction type is constructed consistently. If this is not the case, and deviations of the construction type occur, further testing will be required to comply with the requirements of Approved Document E 2003 [as amended] to the Building Regulations.

ADE requires that sets of tests are carried out on one in ten of each construction type or sub-group. Each set of tests on houses is made up of two airborne sound insulation tests (Two Tests). Each set of tests on flats is made up of two airborne tests on walls and two airborne and two impact tests on floors (Six Tests).

The location of the sets of tests are selected at random by the tester except where specifically requested the Approved Inspector or specialist input from Robust Details.

Rooms were tested unfurnished unless testing is specifically requested in a furnished room. Testing is conducted using the larger room as the source room, with a tolerance of 10% of volume being acceptable either way. Doors, windows and trickle vents must be closed and kitchen units, cupboard doors, wardrobes etc shall be open for the duration of the test when they have been installed against the separating wall under test.

For impact testing, the tests are always conducted on the separating floor that has received Building Control Approval.
It is only ever acceptable to test on a soft floor covering where that covering is an integral part of a Type 1 concrete floor as defined by ADE and cannot physically be lifted by the testers own hands.

Occasionally, rooms may have an awkward layout, such as a stagger, be significant in length (>10m) or contain internal barriers. These requirements are defined in EN ISO 140-14:2004 which all testers hold a copy of as a mandatory entry requirement into the SITMA scheme. Where a test has an awkward layout, the testing method from BS EN ISO 140-14:2004 will be defined in the report and sketches held internally.

Deviations

Background Noise Levels
Background noise levels are often an unavoidable part of testing as testing must take place on a live building site. Though a correction is applied within the calculation, high background noise levels may result in the wall/floor under test not achieving its full potential. Situations can occur where background noise levels are not high but the sound insulation performance of the separating floor or wall is so good that the measured levels are close to the prevailing background levels. The equipment used cannot distinguish between background noise levels and the noise from the speaker.

Deviations Related to the test
If any deviation from the testing method was necessary, details of the deviation are indicated on each individual test certificate (appended to this report). Where deviations were avoidable, or tests have been conducted on a ‘trial’ basis, these will be highlighted at the bottom of each certificate.

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Calibration

Calibration
The calibration certificates are appended to this report under Appendix B. The summary of calibrated equipment used is shown below:

Item	Calibration from	Calibration expiry	Certificate Number
Kit 8	25 Aug 2021	25 Aug 2023	UCRT21/2032
Kit 8	04 Aug 2022	04 Aug 2023	UCRT22/1965

Tester Site Notes:

Test ID 121359 & 121360 Room Volumes Approximate: The room volume is approximate.

Test ID 121359 & 121360
Room Volume >100m3:Approved Document E does not specify maximum test room sizes. In larger rooms, circa in excess of 100m3, there may be a reduced level of measurement reproducibility. Please be aware that, if a third party were to retest this area, they may achieve a different test result.

Commercial Units: This report assumes the minimum performance standard as specified in Approved Document E, Section 0 Tables 0.1a and 0.1b where a residential dwelling is adjacent to a commercial unit.

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Test Results

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Airborne floor Tests – Material Change of Use by James Van Brummen

Certificate Number	Plot & Source Room	Source Room Volume	Plot & Receive Room	Receive Room Volume	**Target** $D_{nT,w}+C_{tr}$	**Result** $D_{nT,w}+C_{tr}$	Pass / Fail
121359	**Unit 100-108 Montague Street Commercial Space**	1000.0m³	**Flat Penthouse, 4 Crescent Road Bedroom 1**	38.0m³	>= 43 dB	>= 53 dB	**Pass**
	Construction: Generic Timber Joist: FT0001** : Generic Timber JoistTimber						
	Deviations: Source Room furnished						
121360	**Unit 100-108 Montague Street Commercial Space**	1000.0m³	**Flat Penthouse, 4 Crescent Road Kitchen / Living Room**	76.0m³	>= 43 dB	>= 61 dB	**Pass**
	Construction: Generic Timber Joist: Timber						
	Deviations: Source Room furnished						

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Appendix A – Individual Certificates

Test Type	Source Room	Partition	Receiver Room
Airborne sound insulation	Unit 100-108 Montague Street Commercial Space	FT0001**	Flat Penthouse, 4 Crescent Road Bedroom 1
Airborne sound insulation	Unit 100-108 Montague Street Commercial Space	FT0001**	Flat Penthouse, 4 Crescent Road Kitchen / Living Room

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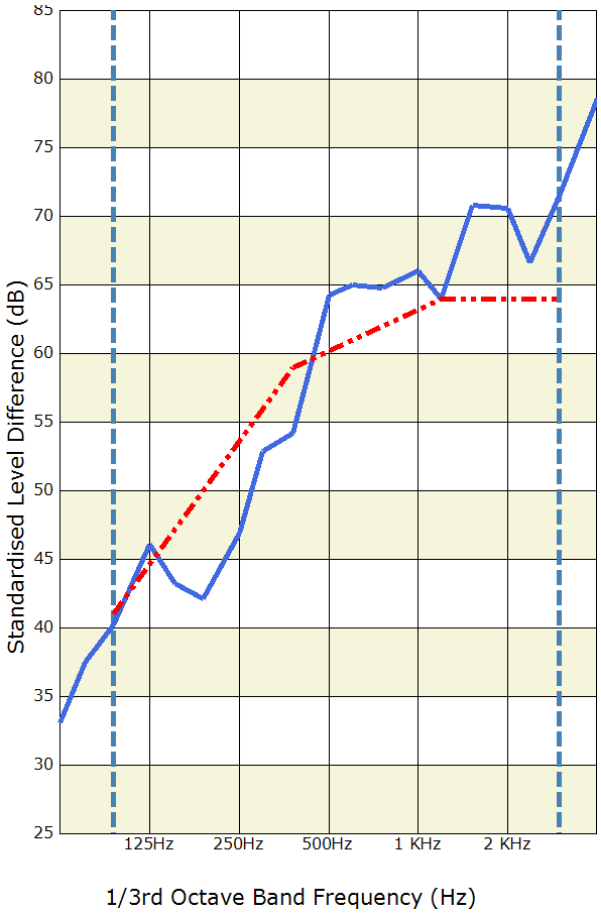
Registered Sound Insulation Test Certificate

Test No:	121359	Test Job Ref:	29380	Test Org Name:	Winthorpe Management Systems t/a WMS
Customer:	STAAC Ltd			Test Type:	Airborne (Floor)
Address:	Suite 1, The Hub , 3 Drove Road , Newhaven	Job Address:	4 Crescent Road, , Worthing	Test Date:	11/07/2023
				Tester:	James Van Brummen
				Site type:	Material Change of Use
Postcode:	BN9 0AD	Postcode:	BN11 1RL	Site Build:	Dwelling-House/Flat

	Source Room:	Partition:	Receiver Room:
Description:	Unit 100-108 Montague Street Commercial Space	FT0001**	Flat Penthouse, 4 Crescent Road Bedroom 1
Volume / Area	1000.0m³	13.1m²	38.0m³

Frequency (Hz)	D_{nT} 1/3 Octave (dB)	BGnd Correction
50 Hz*	27	
63 Hz*	33.1	
80 Hz*	37.5	
100 Hz	40.2	
125 Hz	46.1	
160 Hz	43.2	
200 Hz	42.1	
250 Hz	46.9	
315 Hz	52.9	
400 Hz	54.2	
500 Hz	64.3	
630 Hz	65	X
800 Hz	64.8	X
1 KHz	66	X
1.25 KHz	64	X
1.6 KHz	70.8	X
2 KHz	70.6	X
2.5 KHz	66.6	X
3.15 KHz	71.5	X
4 KHz*	78.6	X
5 KHz*	73.8	

Evaluation based on field measurement using results obtained by an engineering method



*Outside scope of accreditation

Above graph shows frequency range according to the curve of reference values within BS EN ISO 717-1

$D_{nT,w}$ (C; C_{tr}) [dB]: 60 (-2, -7) dB
$D_{nT,w}$+ C_{tr} [dB]: 53 dB
Minimum Pass Level [dB]: 43 dB

PASS
Adverse Aggregated Deviations [dB]: 26.5

Partition Detail:FT0001** : Generic Timber JoistTimber

Test Exceptions (if any): Source Room furnished

AIRBORNE SOUND INSULATION TEST: Approved Document E (2003) including 2004, 2010, 2013, and 2015 Amendments
BS EN ISO 140 - Part 4:1998: Acoustics - measurement of sound in buildings and of building elements
BS EN ISO 717 - Part 1:1997: Acoustics - rating of sound in buildings and of building elements

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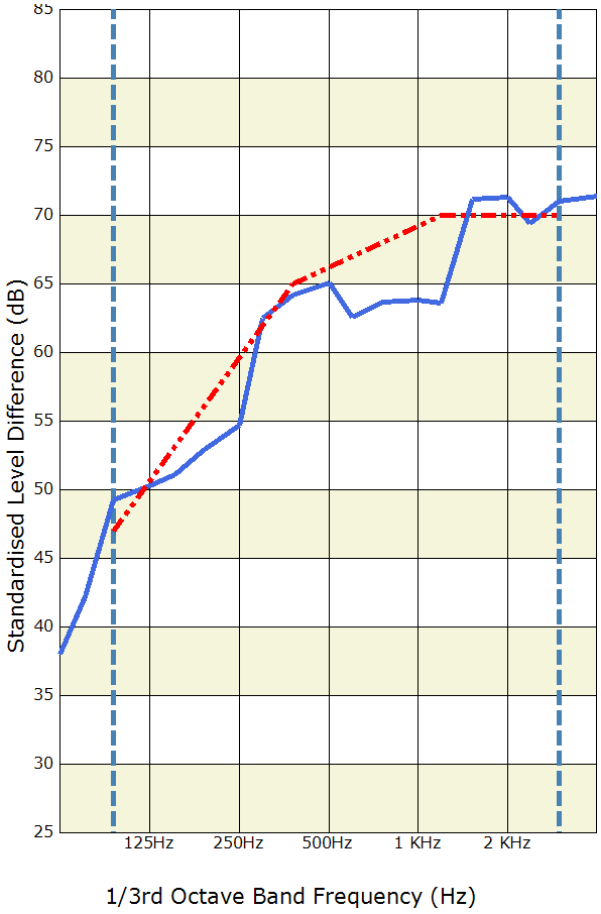
Registered Sound Insulation Test Certificate

Test No:	121360	Test Job Ref:	29380	Test Org Name:	Winthorpe Management Systems t/a WMS
Customer:	STAAC Ltd			Test Type:	Airborne (Floor)
Address:	Suite 1, The Hub , 3 Drove Road , Newhaven	Job Address:	4 Crescent Road, , Worthing	Test Date:	11/07/2023
				Tester:	James Van Brummen
				Site type:	Material Change of Use
Postcode:	BN9 0AD	Postcode:	BN11 1RL	Site Build:	Dwelling-House/Flat

	Source Room:	Partition:	Receiver Room:
Description:	Unit 100-108 Montague Street Commercial Space	FT0001**	Flat Penthouse, 4 Crescent Road Kitchen / Living Room
Volume / Area	1000.0m³	27.0m²	76.0m³

Frequency (Hz)	D_{nT} 1/3 Octave (dB)	BGnd Correction
50 Hz*	30.8	X
63 Hz*	38	
80 Hz*	42.2	
100 Hz	49.3	
125 Hz	50.3	
160 Hz	51.1	
200 Hz	52.9	
250 Hz	54.7	
315 Hz	62.5	
400 Hz	64.2	
500 Hz	65.1	X
630 Hz	62.6	
800 Hz	63.7	
1 KHz	63.8	
1.25 KHz	63.6	X
1.6 KHz	71.2	X
2 KHz	71.3	X
2.5 KHz	69.4	X
3.15 KHz	71	X
4 KHz*	71.4	X
5 KHz*	71.5	

Evaluation based on field measurement using results obtained by an engineering method



*Outside scope of accreditation

Above graph shows frequency range according to the curve of reference values within BS EN ISO 717-1

$D_{nT,w}$ (C; C_{tr}) [dB]: 66 (-2, -5) dB
$D_{nT,w}$+ C_{tr} [dB]: 61 dB
Minimum Pass Level [dB]: 43 dB

PASS
Adverse Aggregated Deviations [dB]: 31.9

Partition Detail:Timber

Test Exceptions (if any): Source Room furnished

AIRBORNE SOUND INSULATION TEST: Approved Document E (2003) including 2004, 2010, 2013, and 2015 Amendments
BS EN ISO 140 - Part 4:1998: Acoustics - measurement of sound in buildings and of building elements
BS EN ISO 717 - Part 1:1997: Acoustics - rating of sound in buildings and of building elements

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Appendix B – UKAS Calibration Certificates

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CERTIFICATE OF CALIBRATION

0653

Date of Issue: 25 August 2021 **Certificate Number: UCRT21/2032**

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory



K. Mistry

Customer	Site Sound Ltd The Old Stabling 55 Bradbourne Road Sevenoaks Kent TN13 3PZ			
Order No.	Kit 8 Recalibration August 2021			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NA-28	30152127
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-23	42203
	Rion	Microphone	UC-59	07632
	Rion	Calibrator	NC-74	34557143
		Calibrator adaptor type if applicable		NC-74-002
Performance Class	1			
Test Procedure	TP 2.SLM 61672-3 TPS-49 *Procedures from IEC 61672-3:2006 were used to perform the periodic tests.*			
Type Approved to IEC 61672-1:2002	Yes	Approval Number	21.21/07.01	
	If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003			
Date Received	19 August 2021	ANV Job No.	UKAS21/08553	
Date Calibrated	25 August 2021			

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	02 September 2019	UCRT19/1949	0653

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 04 August 2022 **Certificate Number: UCRT22/1965**

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory



B. Bogdan

Customer	Site Sound Ltd The Old Stabling 55 Bradbourne Road Sevenoaks Kent TN13 3PZ			
Order No.	Kit 8 NC76 calibration 2022			
Test Procedure	Procedure TP 1 Calibration of Sound Calibrators			
Description	Acoustic Calibrator			
Identification	*Manufacturer*	*Instrument*	*Model*	*Serial No.*
	Rion	Calibrator	NC-74	34557143

The calibrator has been tested as specified in Annex B of IEC 60942:2003. As public evidence was available from a testing organisation (PTB) responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2003.

ANV Job No.	UKAS22/08503	
Date Received	02 August 2022	
Date Calibrated	04 August 2022	
Previous Certificate	*Dated*	24 August 2021
	Certificate No.	UCRT21/2029
	Laboratory	0653

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