

Noise Impact Assessment

Barfoots of Botley Limited
Sefter Farm
Pagham Road
Pagham
Bognor Regis
West Sussex
PO21 3PX



March 2025

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i Contact information

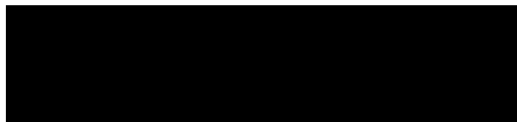
Site address

Barfoots of Botley
Sefter Farm
Pagham
West Sussex
PO21 3PX

Contact: Richard Goodall

Telephone:

E-mail:



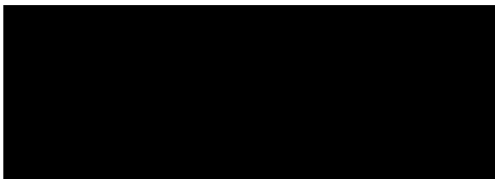
Report co-ordinator

Apple Environmental Limited
Unit 3 Estevan Farm
Stoney Lane
Medstead
Alton
Hampshire
GU34 5EL

Contact: Laura Charman

Telephone:

E-mail:



Report checking

Final check by:



Adrian Whittle:



ii Company information



Unit 3 Estevan Farm, Stoney Lane, Medstead, Alton, Hampshire GU34 5EL



www.appleenvironmental.co.uk

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1 Introduction and aims

1.1 Introduction

This report has been prepared in support of a planning application for the construction of an extension to the south of the existing production building at Sefter Farm. The extended building will include the installation of new chiller plant to be located on the eastern façade, which is expected to run 24 hours per day.

The objective of this assessment is to determine whether noise from the proposed chiller plant will have the potential to impact the closest residential receptor.

This assessment has been undertaken by Laura Charman; Tech.ioA.

1.2 Aims and objectives

In order to address the highlighted noise concerns an assessment has been carried out in accordance with the Department for Communities and Local Government National Planning Policy Framework 2024, and with reference to other guideline documents as detailed below in Section 2 and Section 6. In addition to this, reference has been made to current Arun District Council planning policies.

The overall aim of this work therefore is to determine the extent to which the closest existing dwelling could be impacted by noise emanating from the proposed cooling plant.

The principal objectives are as follows:

- to identify all dominant sound sources at the site;
- to monitor noise at the nearest dwelling to determine the day-time and night-time background level;
- to undertake ambient and residual noise monitoring close to the source location; and
- to use all obtained sound level data to mathematically determine the impact from source noise at the nearest dwelling.

2 Relevant guidance

2.1 Planning guidance

2.1.1 Arun District Council Local Plan: 2011 - 2031

In undertaking this assessment the Arun District Council (CDC) Local Plan has been referred to, in which the following is deemed to have some relevance:

Policy QE DM1 - Paragraph 2 states that developers proposing new noise generating development must seek advice from an early stage to determine the level of noise assessment required. Proposals will need to be supported by:

- a. Evidence to demonstrate that there are no suitable alternative locations for the development.
- b. A noise report which provides accurate information about the existing noise environment, and the likely impact of the proposed development upon the noise environment. The report must also demonstrate that the development meets appropriate national and local standards for noise, as set out in Annex 1 of the Planning Noise Advice Document: Sussex, and any mitigation measures required to ensure noise is managed to an acceptable level.
- c. Evidence to demonstrate that the development will not impact upon areas identified and valued for their tranquillity, including gaps between settlements which are important to the enjoyment of Arun's countryside, its habitats and biodiversity.

Paragraph 21.2.9 of the Plan states that where new noise generating development such as industrial and commercial and outdoor sport and recreation uses are proposed, it is expected that they will be located at an appropriate distance away from noise sensitive development, i.e. residential areas, schools and hospitals. If the development is likely to cause unacceptable levels of disturbance, the developer should consider alternative locations for the site.

Paragraph 21.2.10 of the Plan states that if there are no alternative sites available then the applicant will need to demonstrate that all steps have been taken to reduce noise at source. Finally, if all reasonable steps have been taken to reduce the noise at source, but the development is still likely to have adverse effects, then adequate measure to mitigate against the noise should be put in place to protect the noise sensitive use. This could include consideration of noise barriers and site layout first, then insulation of buildings as a last resort.

2.1.2 NPPF

Since the revocation of Planning Policy Guidance 24 (PPG24), the National Planning Policy Framework (NPPF) has been introduced - and subsequently revised most recently in December 2024. This document provides some general guidance to local authorities on considering the impact of noise in planning and policy decisions. Reference is specifically made to the following paragraphs:

- Paragraph 130 Sub-section (c) similarly implies that any development should be sympathetic to the local environment;
- Paragraph 174 Sub-section (e) which states that existing development should not be put at risk from unacceptable levels of noise pollution;
- Paragraph 185 Sub-sections (a) and (b) state that noise impacts should be mitigated or reduced to a minimum to avoid impacting health of the quality of life, and those tranquil areas which have remained relatively undisturbed by noise should be protected; and
- Paragraph 187 states that planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities. Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business could have a significant adverse effect on new development in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

2.2 Technical guidance

In addition to the above, technical guidance has primarily been used for the purpose of this assessment; as detailed below.

2.2.1 British Standard 4142:2014+A1:2019

British Standard 4142 is used to assess the impact of industrial and commercial sound, by means of determining the influence that such sound may have on 'normal' background levels. It covers a range of methods allowing the assessor to decide what level of detail may be appropriate.

The standard also allows for tonal noise and impulsive sounds, and acknowledges that the influence of the context in which the sound is heard is a significant modifier of the impact, in line with subjective assessment.

The standard supports current UK planning guidance and Environment Agency requirements on noise impact assessments.

2.2.2 British Standard 7445-1:2003

Part 1 of the British Standard 7445-1:2003 defines the basic quantities required for the description of noise in community environments and describes procedures for the determination of these quantities. It provides guidance on the positioning of instrumentation including the distance from the exposed building and the preferred height of the microphone as well as detailing measurements to be taken during preferable meteorological conditions.

2.2.3 British Standard 8233:2014

British Standard 8233:2014 has reviewed and amended the former 1999 standard. As before, it sets out guidance on desirable internal ambient noise levels for dwellings. Table 1 below summarises the recommended acoustic design criteria for a dwelling.

Table 1 BS 8233:2014 desirable acoustic design criteria for good standard

Location	Internal noise level	
	Daytime	Night time
Living room	35dB L _{Aeq} , (16hr)	-
Dining room	40dB L _{Aeq} , (16hr)	-
Bedroom	35dB L _{Aeq} , (16hr)	30dB L _{Aeq} , (8hr)

It is therefore generally recommended that for a dwelling, acceptable internal noise levels during the daytime should not exceed 35dB $L_{Aeq,16hr}$, and during the night time, noise levels of 30dB $L_{Aeq,8hr}$.

In addition, it also states that where development is considered desirable or necessary then despite external noise levels exceeding these guidelines, the internal target may be relaxed by up to 5dB and 'reasonable' conditions can still be achieved.

The standard also reiterates the fact that it is desirable that noise levels in outdoor amenity areas such as gardens and balconies do not exceed 50dB $L_{Aeq,T}$ and that 55dB $L_{Aeq,T}$ should be regarded as the upper limit. However it also states that this may not be achievable in some areas, such as city centres, and that a compromise between noise and the convenience of living in these areas can be met.

2.2.4 WHO Guidelines for Community Noise, 1999

The WHO Guidelines for Community Noise also consider the impact of night-time exposure to noise and sleep disturbance, such that if negative effects on sleep are to be avoided, the equivalent sound pressure level ($L_{Aeq,8hr}$) should not exceed 30dB indoors for continuous noise.

If the noise is not continuous, sleep disturbance correlates best with L_{Amax} and effects have been observed at 45dB or less.

These guidelines state that this is particularly true if the background level is low. Noise events exceeding 45dB(A) should therefore be limited where possible. More specifically, the document states that 10 to 15 occurrences per night that exceed the limiting L_{Amax} external noise level of 45dB may be considered acceptable.

For sensitive groups, an even lower limit would be preferred but this value is not specified. It also declares that it should be possible to sleep with a bedroom window slightly open (resulting in a reduction of 15dB(A) from outside to inside). To prevent sleep disturbances, the equivalent sound pressure level and the number and level of sound events should be considered. Mitigation targeted to the first part of the night is believed to be effective for the ability to fall asleep.

2.2.5 The Calculation of Road Traffic Noise 1988 (CRTN)

CRTN provides general guidance on the direct measurement of road traffic noise in which L_{A10} (18hr) values are generally referred to. In situations where road traffic noise is clearly dominant and relatively consistent the guidance allows for a shortened assessment to be undertaken, in which arithmetic average values can be obtained over three consecutive 1 hour periods between 10.00H and 17.00H.

In doing so the L_{A10} (18hr) value can be supplemented for a L_{A10} (3hr) - 1dB. This in turn can be converted to a day-time L_{eq} by means of the following: L_{Aeq} (16hr) = L_{A10} (18hr) - 2dB.

For this purpose the corresponding sound level measurements need to be obtained at a position between 4 - 15m from the source traffic in open space.

2.2.6 Professional Practice Guidance on Planning and Noise 2017 (ProPG)

The Professional Practice Guidance: Planning & Noise (ProPG) was published in 2017 by the Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH). It aims to provide guidance on noise during the planning stage for new residential development and provides a standardised approach to assess the suitability. It is not the purpose of this guidance to replace that which is in the NPPF, although it does significantly expand on the noise policies within that framework.

The first step of a ProPG assessment is to measure noise levels around a receptor site in order to understand the noise climate. Once this is completed, it sets out various assessment risk-based routes which are dependent on those noise levels. It is important to note that ProPG is generally applicable to vehicular noise only, and should not be used to assess industrial noise.

3 Area description

3.1 General overview

The activities on the site are principally those involved with the preparing, packing, storage and distribution of vegetable produce; along with the anaerobic digestion of any organic waste product.

The site is essentially in use throughout a full 24 hour period, 7 days per week, during which time heavy vehicles will enter the site for loading and unloading. It is also understood that on some occasions these may park up with their engines running and/or trailer refrigeration units operating. It is noted however that the proposed extending of the production building should result in no direct increase in vehicle movement but may actually see a decrease over time.

The proposal is to construct an extension to the south of the existing production building, with loading and unloading activities to continue to take place on the western façade of the production building, where this would continue to be screened from the nearest dwelling.

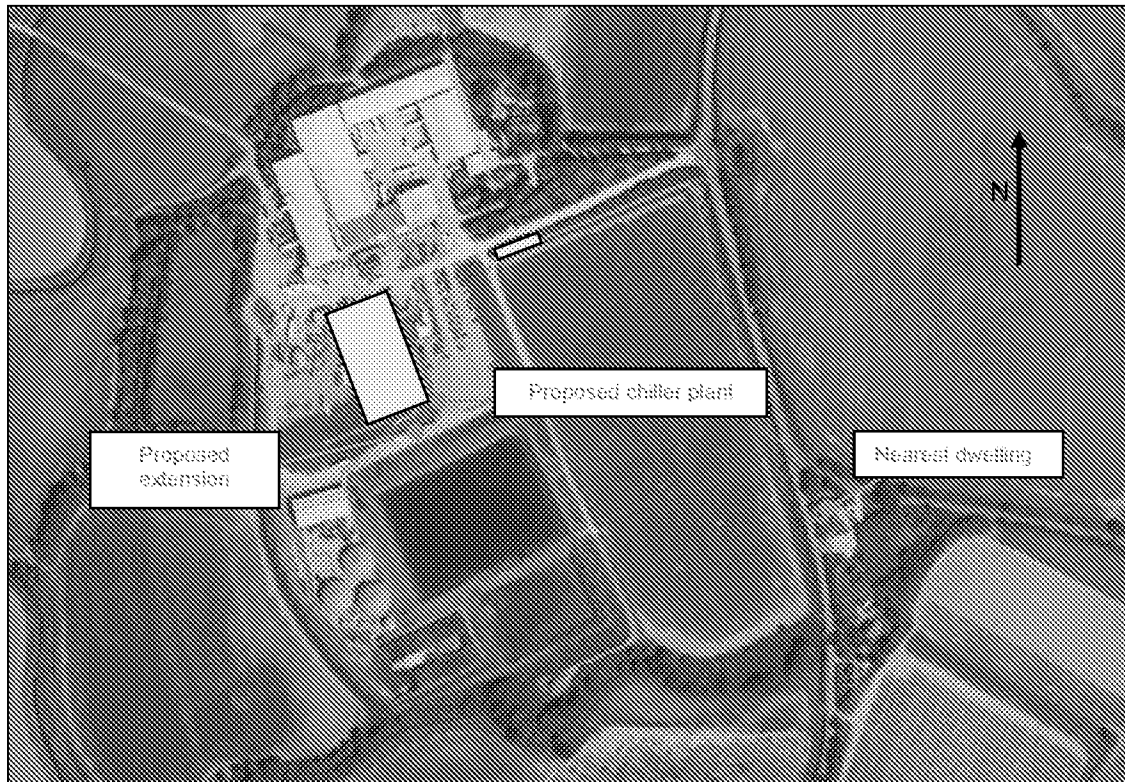
The principal 'new' source of noise in this instance would appear to be the proposed chiller plants only, which would be operational 24-hours a day.

It is understood that there would be three new chiller fan units introduced, each with a sound pressure level of 65dB(A) measured at a distance of 1m.

With regards to off-site residential receptors, it is understood that the two dwellings to the immediate north of the site entrance are associated with the site itself; furthermore they would be entirely screened from any new plant by the existing buildings and features; therefore the closest dwelling with any potential to be impacted by site noise would appear to be the Old Sefter School House which is located on Pagham Road at its junction with Sefter Road, around 250m to the southeast of the proposed extension.

These above features have been noted on the aerial photograph below, Figure 1 and in Photographs 1 and 2.

Figure 1 Current site layout and features

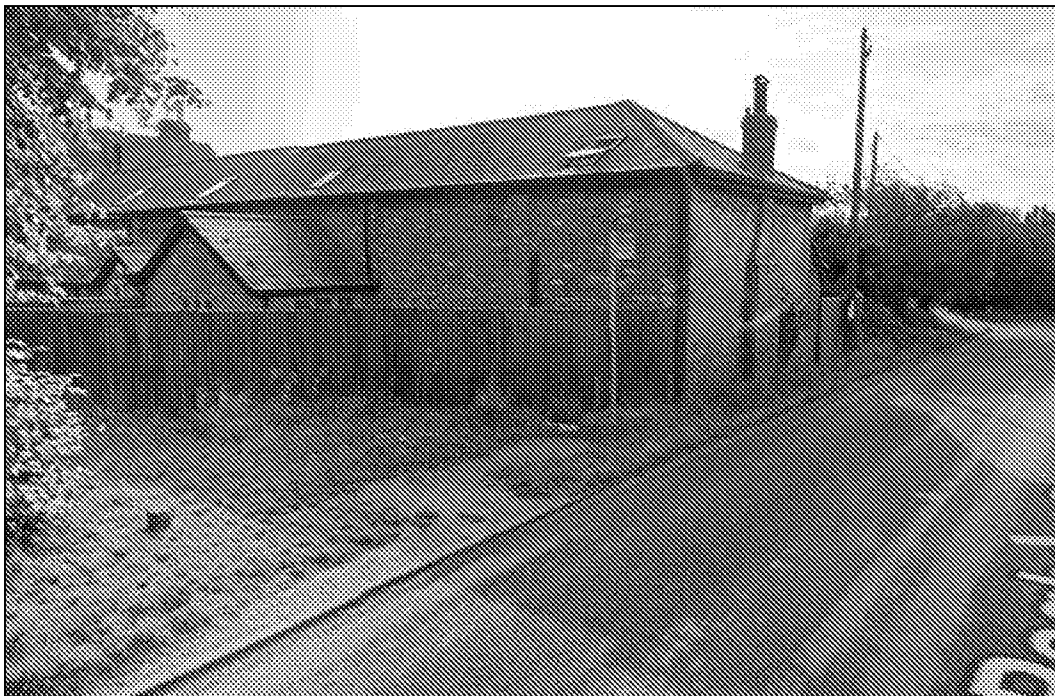


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Photograph 1 Showing the proposed extension and chiller plant location



Photograph 2 Showing the nearest dwelling on Pagham Road



4 Survey methodology

4.1 Instrumentation

As stated, this report aims to determine the expected impact that the proposed chiller plant fans may have on the highlighted residential receptor to the southeast.

In performing this assessment, noise readings had been obtained by means of Cirrus Optimus CR171B Class I integrating sound pressure level meters. These were calibrated prior to use at 94dB and checked for drift following their use, by means of a CR151 Cirrus Acoustic Calibrator. The instruments were also fitted with one-third octave band frequency analysers and tonal noise detection capability, thereby allowing other supporting data to be considered, along with the general broadband readings.

The instrumentation details and serial numbers are as shown below in Table 2. Calibration documentation for the sound level meters and acoustic calibrator has been appended to this report.

Table 2 Sound level instrumentation used

Equipment	Description	Serial No.
Cirrus Optimus CR:171B	Class 1 sound level meter with 1/3 octave frequency analyser	G068537
Cirrus Optimus CR:171B	Class 1 sound level meter with 1/3 octave frequency analyser	G068504
Cirrus Acoustic Calibrator CR:151	IEC 60942.2003 Class 1 calibrator	70846

4.2 BS4142 assessment

This assessment determines any impact that noise from the proposed chiller plant may have on the existing dwelling by means of applying the prescribed guidance.

The external ambient sound levels were determined by obtaining the sound pressure level of each (proposed) chiller plant and logarithmically adding these together to obtain a value 1m away from the proposed source.

Residual sound pressure levels were obtained at a position close to the proposed fans over a 15-minute interval between 12:10H and 12:25H on Monday 24th February 2025. In doing so, L_{Aeq} , L_{Amax} , and a selection of percentile values have been obtained from one-second readings.

The instrument was set-up at a height of 1.5m above ground level, with the microphone angled towards the direction of the proposed source. This position was deemed to be appropriate for obtaining representative residual sound levels.

For the purposes of performing a BS4142 assessment the background measurement was obtained close to the existing dwelling over a period of 24-hours whilst the source noise was not occurring, providing both day-time and night-time values.

The weather conditions were changeable, but deemed to be suitable throughout the measurement period with an ambient temperature of (7 - 10°C), with light to moderate southeast and southwest winds. This has been detailed below in Section 4.3 (Table 3).

The sound level monitoring instrument used in each instance has been shown below in Photographs 3 and 4, and the positions shown in Figure 2 below.

Photograph 3 The sound level measurement position (residual)



Photograph 4 The sound level measurement position (background)



Figure 2 Sound level measurement positions in relation to the proposed noise source



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4.3 Weather conditions

The weather conditions throughout the sound level monitoring period have been detailed below in Table 3.

The wind predominantly came from the southeast or southwest, and was generally light to moderate.

It is recognised that the wind would not necessarily have been bringing noise from the (proposed) chiller plants towards the microphone, but as this was the prevailing wind direction it could be argued that this is generally representative of the situation in this area.

Table 3 Weather conditions at the site during noise monitoring

Date	Time	Temp / °C	Rainfall	Wind speed / m/s	Wind direction
24/02/2025	12:00	9	0	4.4	SE
	15:00	10	0	5.7	SE
	18:00	9	0	5.8	SE
	21:00	8	0	5.8	SE
25/02/2025	00:00	8	0	5	SE
	03:00	7	0	3.3	SE
	06:00	7	0	5.2	SW
	09:00	7	0	2.5	SW
	12:00	8	0	4.1	SW

5 Monitoring results

At the time of undertaking the monitoring the most dominant noise identified at the assessment location was existing site noise such as operating conveyor belts and site descriptive noises along with road traffic using Pagham Road to the southeast; whereas secondary sounds were distant construction noise and birdsong.

Monitoring was undertaken close to the proposed source location throughout a 15-minute period on the morning of Monday 24th March 2025 in order to obtain the residual sound level from the proposed source. The ambient measurement was calculated by adding together the sound pressure level of each proposed chiller unit at 1m, of 65dB(A), to obtain a combined sound pressure level for the three units of 70dB(A). The L_{Aeq} and L_{Amax} from these two parameters have been reproduced below in Table 4. The corresponding noise data was downloaded into NoiseTools® software, for which the corresponding summary sheet has been appended to this report.

Of these, the ambient sound represents the sound level when the chiller plant will be operating, whereas the residual sound represents the sound measured at the same location whilst the chiller plants were not operating, at a distance of 1m from the plant. In actuality the chiller plant would potentially be running 24-hours per day; albeit thermostatically cutting in and out throughout that time.

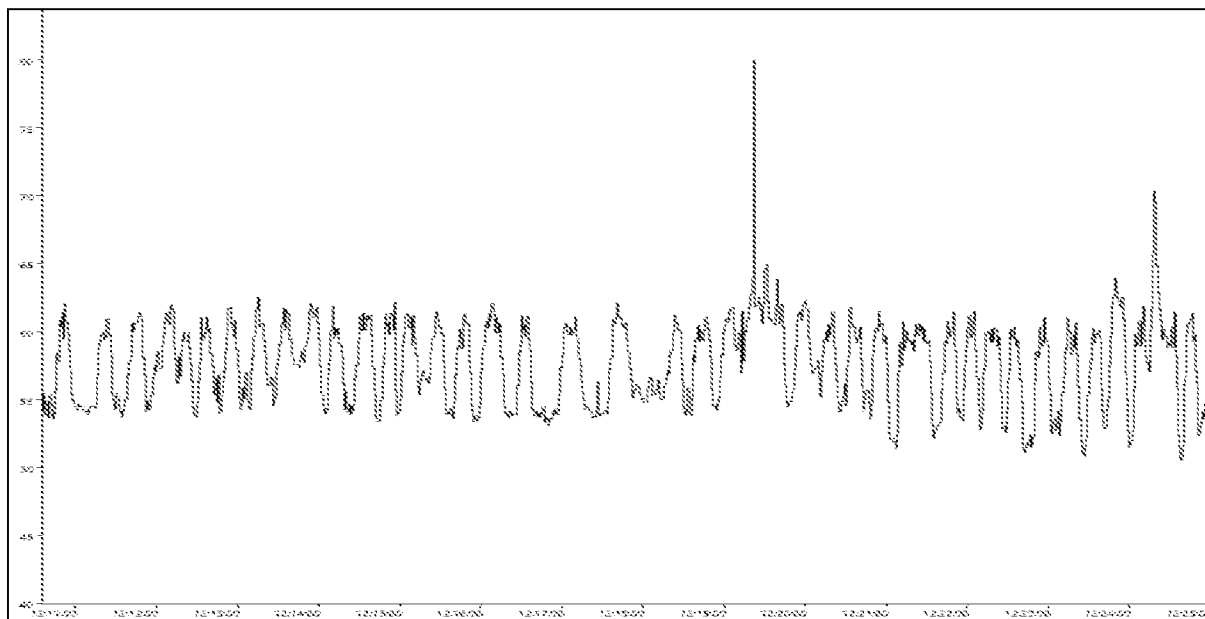
Table 4 Sound level readings for the proposed chiller plant

Parameter	Chiller plant operating (ambient sound level)	Chiller plant not operating (residual sound level)
	Manufacture data (65dB(A) x 3)	12.10H - 12.25H / dB(A)
	Microphone positioned approx.1m from the proposed chiller fans	
L_{Aeq}	70.0	62.0
L_{Amax}	Not known	92.3

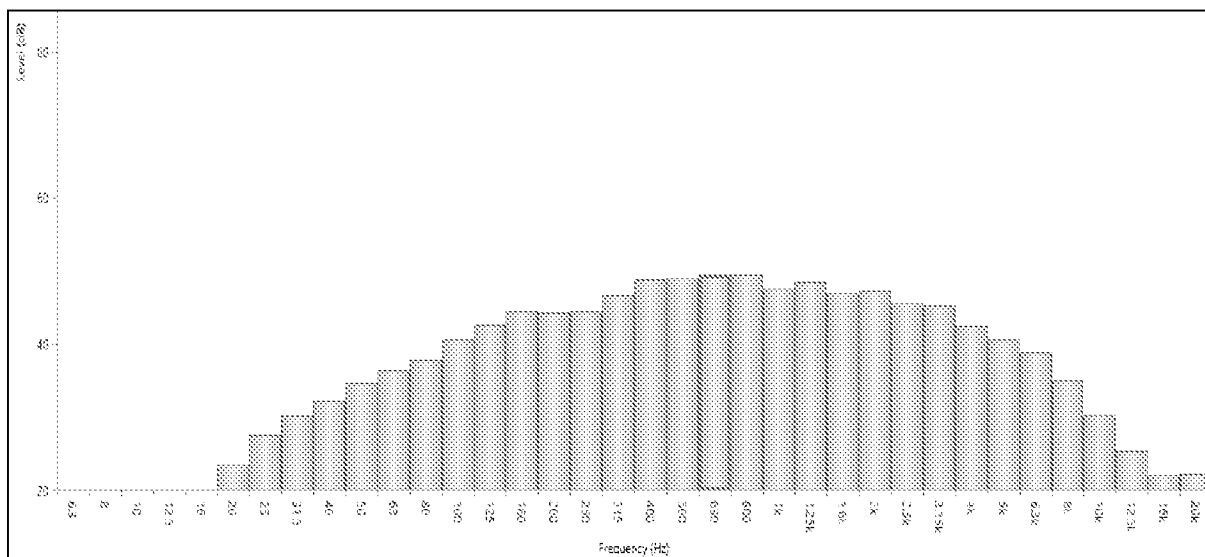
A plotted profile showing the $L_{Aeq}(T=15mins)$ trend for the time period has additionally been reproduced below in Graph 1. The corresponding one-third octave band analysis profile has been reproduced below in Graph 2

In referring to Graph 1, it can be seen that the noise level was generally consistent, other than two spurious peaks corresponding to two isolated short noisy impact events nearby on the adjacent waste conveyor system.

Graph 1 $L_{Aeq}(T=15\text{mins})$ measurement profile with the proposed chiller plant not operating (residual sound level)



Graph 2 A-weighted 1/3 octave banding with the chiller plant not operating



In considering the above profile in Graph 2, it was noted that the dominant frequency was 630Hz, with no evidence of tonality. These low frequency characteristics are presumed to be associated with the existing plant noise along with the adjacent conveyor belt motor.

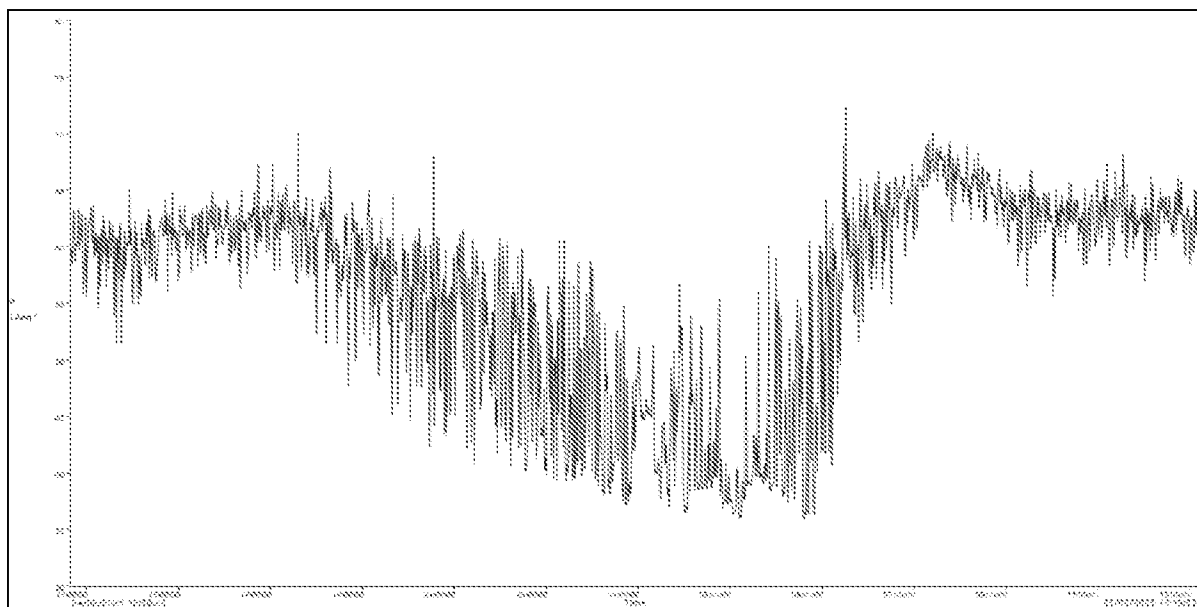
The day-time and night-time background sound level measurements for the BS4142 assessment were obtained over a 24-hour period at a location 18m from the dwelling façade, which was deemed to be a representative position.

In doing so the 24-hour background level (expressed as the L_{A90}) was measured as 39dB; which corresponded to 43dB(A) during the day-time (07.00H - 23.00H) and 38dB(A) during the night-time (23.00H - 07.00H).

Once again the noise data was downloaded into the NoiseTools® software, for which the corresponding summary sheet has been appended to this report.

The L_{Aeq} profile at the background position has been reproduced below in Graph 3.

Graph 3 L_{Aeq} measurement profile over 24-hours



The above profile follows a typical diurnal variation for a position of this nature. The dominant noise tended to be traffic using the adjacent Pagham Road, which despite being infrequent during the night-time, was still the dominant source during that period.

6 Noise evaluation and interpretation

6.1 Determination of noise impact (BS4142)

In view of the fact that the noise source in this instance relates to proposed chiller fans at a commercial premises, an assessment of the impact would normally be made by means of applying the British Standard BS4142:2014 + A1:2019.

This determines the sound level rating over the background sound level due to the presence of a commercial or industrial sound source.

The Standard also takes into consideration other audible characteristics of the noise that are likely to increase the possibility of complaint such as tonality, impulsivity and intermittency.

Residual values have been obtained 1m away from the proposed source (chiller plant), whilst ambient values have been logarithmically calculated from manufacturer data. Background values have been obtained 18m from the nearest receptor position, which was again deemed to be appropriate as a main road lies between the site and the dwelling.

As stated above in Section 5, the greatest noise would be when the chiller plant is operating (ambient), where a calculated noise level of 70dB(A) would be expected for a position 1m from the proposed source.

The residual sound level at the same measurement position when the chiller plants would not be operating was 62dB(A).

By using the following equation the specific values can be calculated.

$$L_{Aeq} = 10\log(10^{L_1} - 10^{L_2})$$

Where: L_1 is the ambient measurement and L_2 is the residual measurement.

The specific noise level at 1m from the source is therefore calculated as 69dB(A).

It has been noted that the nearest receptor dwelling lies around 250m to the southeast of this source. Using the above L_{eq} value of 69dB(A), the impact that this may have on the closest receptor can be calculated using the following equation:

$$L_1 - 20\log(r_2/r_1)$$

Where: L_1 is the specific noise level expressed as the calculated L_{Aeq} , r_1 is the distance from the source to the measurement position, and r_2 is the distance from the source to the receptor.

For the highlighted receptor therefore, the reference sound pressure level of 69dB(A) was obtained at a distance of 1m from the source, and the estimated distance of the closest dwelling façade to the source is 250m, giving:

$$69.3 - 20\log(250/1) = \underline{21\text{dB}}$$

It is noted that chiller plant can often produce a tonal noise and furthermore may on occasions be just perceptible at the receptor position above the general traffic (and other) noise. Consequently, 5dB should be added for this value to account for any tonality characteristic and potentially occasional perception, bringing the theoretical noise impact (specific noise) to 26dB.

The background noise level (L_{A90}) measured in the vicinity of the receptor dwelling during the day-time period has been reported as 43dB(A).

As the specific noise level appears to be 17dB below the background noise, this suggests that a 'low adverse impact is likely' at this receptor such that this may be inaudible.

The background noise level (L_{A90}) measured in the vicinity of the dwelling during the night-time period between has been reported as 38dB(A).

As the specific noise level appears to be 12dB below the night-time background noise, this similarly suggests that a 'low adverse impact is likely'.

Furthermore it is noted that there is a dense 10m hedgerow present between the measurement position and the dwelling suggesting that any noise from the future chiller plant is likely to be even lower than that suggested above.

The corresponding calculations have been shown below in Tables 5 and 6. Any explanations relating to the input parameters used have been added as footnotes beneath the table.

Table 5 BS4142 assessment at the nearest proposed receptor façade (day-time)

Parameter	Reference	Value
Ambient sound level (calculated from manufacturer data)	Table 5 and note (a) below	70dB
Residual sound level (measured $L_{(A)eq}$ at the source location)	Table 5 and note (a) below	62dB
Background sound level (measured $L_{(A)90}$ at the receptor location)	Note (c) below	43dB
Specific sound level (calculated as the ambient sound - the residual sound)	Note (d) below	69dB
Specific sound level (calculated to the receptor)	Note (d) below	21dB
Acoustic feature correction(s)	BS4142 Clause 9.2 and note (e) below	+5dB
Rating level: (specific sound + barrier mitigation)	BS4142 Clause 9.2	26dB
Excess of rating over background sound level	BS4142 Clause 11	-17dB
Uncertainty of the assessment (BS4142 Clause 10)	Although it is quite likely that this measurement can be obtained under repeatable conditions, there will inevitably be variables that can affect the extent of the excess of rating over the background sound level at certain times. It is possible also that these variables could be significant enough to produce a greater excess of rating outcome than stated above on other days or at other times. The presumption has been made that this current assessment was performed under typical working conditions at the site, and under reproducible conditions.	

Table 6 BS4142 assessment at the nearest proposed receptor façade (night-time)

Parameter	Reference	Value
Ambient sound level (calculated from manufacturer data)	Table 5 and note (a) below	70dB
Residual sound level (measured $L_{(A)eq}$ at the source location)	Table 5 and note (a) below	62dB
Background sound level (measured $L_{(A)90}$ at the receptor location)	Note (c) below	38dB
Specific sound level (calculated as the ambient sound - the residual sound)	Note (d) below	69dB
Specific sound level (calculated to the receptor)	Note (d) below	21dB
Acoustic feature correction(s)	BS4142 Clause 9.2 and note (e) below	+5dB
Rating level: (specific sound + barrier mitigation)	BS4142 Clause 9.2	26dB
Excess of rating over background sound level	BS4142 Clause 11	-12dB
Uncertainty of the assessment (BS4142 Clause 10)	Although it is quite likely that this measurement can be obtained under repeatable conditions, there will inevitably be variables that can affect the extent of the excess of rating over the background sound level at certain times. It is possible also that these variables could be significant enough to produce a greater excess of rating outcome than stated above on other days or at other times. The presumption has been made that this current assessment was performed under typical working conditions at the site, and under reproducible conditions.	

Supporting notes:

(a) The ambient value shown is the calculated $L_{eq(A)(15mins)}$ obtained 1m from the source when the chillers are operating

(b) The residual value shown is the measured $L_{eq(A)(15mins)}$ obtained 1m from the source when the chillers are not operating

(c) The background sound level shown is the measured $L_{90(A)}$ obtained close to the closest receptor position over a day-time (12:38 - 23:00H) and night-time (23:00 - 07:00H) period..

(d) The specific sound has been obtained by means of the following equations:

$$L_{spec.} = 10\text{Log}(10^{L(Amb)/10} - 10^{L(Res)/10})$$
$$L_{spec.} = L_{spec} - 20\log(r^2/r^1)$$

(e) It is expected for the specific sound to be considered 'tonal' at the receptor position.

6.3 Uncertainties

In undertaking an assessment of this nature a number of uncertainties will invariably be present; although efforts have been made to minimise such. Firstly, the general activities occurring within the existing yard can be highly variable; however it is presumed that the measurements were obtained under 'typical' conditions.

Secondly, the weather can potentially have a significant influence, resulting in variable sound exposure levels. The measurements were obtained throughout a dry period with a slight south-easterly and south-westerly wind. As these conditions will vary day to day, the sound impact at the receptor is presumed to be lesser on some days and greater on other days.

Finally, the specific noise levels reported have an uncertainty factor of $\pm 1\text{dB(A)}$ due to the uncertainty of the sound level meter ($\pm 0.7\text{dB(A)}$), the wind conditions ($\pm 0.5\text{dB(A)}$) and the traffic conditions ($\pm 0.5\text{dB(A)}$)⁽¹⁾.

This has been calculated using the following equation:

$$\sqrt{0.7^2 + 0.5^2} = 0.9^2 = 1\text{dB(A)}$$

On the basis therefore that the uncertainties could result in an overall increase of 1dB(A) at the receptor, it is not expected for an increase of this magnitude to be significant to a human receptor.

⁽¹⁾ *Uncertainties in Environmental Noise Assessments - ISO1996, effects of Instrument Class and Residual Sound: Marvell, Affalo, B&K Sound and Vibration, 2008.*

7 Summary

This report has assessed the impact that new chiller plant would have on the nearest residential dwelling to the southeast, as part of the proposed extending of the existing production building.

An assessment has been made through the application of BS4142, for both day-time and night-time scenarios, from which it has been concluded that 'a low adverse impact is likely'; suggesting that any noise from the proposed chiller fans is expected to be inaudible at the dwelling.

This conclusion has been based on the understanding that there would be three new chiller fan units located on the southwestern corner of the extended section, with each having a sound power level of 65dB(A) at 1m.

8 References

1. The Little Red Book of Acoustics: A Practical Guide, 2nd Ed., Watson, R. and Downey, O., Blue Tree Acoustics, 2008.
2. National Planning Policy Framework, Department for Communities and Local Government, December 2023.
3. The Test Valley Borough Local Plan 2011 - 2029
4. Professional Practice Guidance on Planning and Noise; Association of Noise Consultants, the Institute of Acoustics and the Chartered Institute of Environmental Health - May 2017
5. British Standard 7445-1:2003 Description and measurement of environmental noise - guide to quantities and procedures.
6. British Standard 4142:2014+A1:2019 Rating and assessing industrial and commercial sound.
7. British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings
8. World Health Organisation Night Noise Guidelines for Europe, WHO, 2018
9. World Health Organisation Guidelines for Community Noise, WHO, 1999
10. The Control of Road Traffic Noise (CRTN) 1988 (HMSO).

APPENDIX

Noise profile summary sheets

Sound level instrument calibration



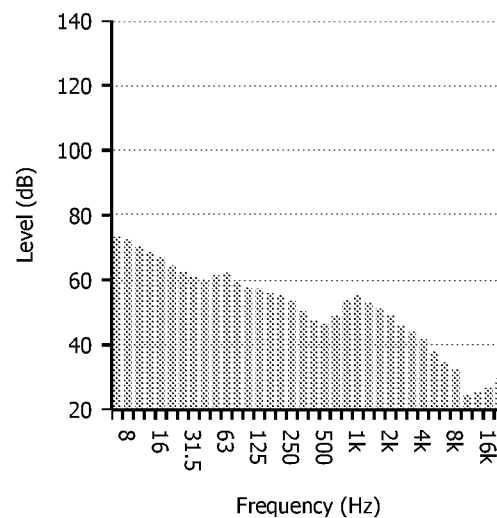
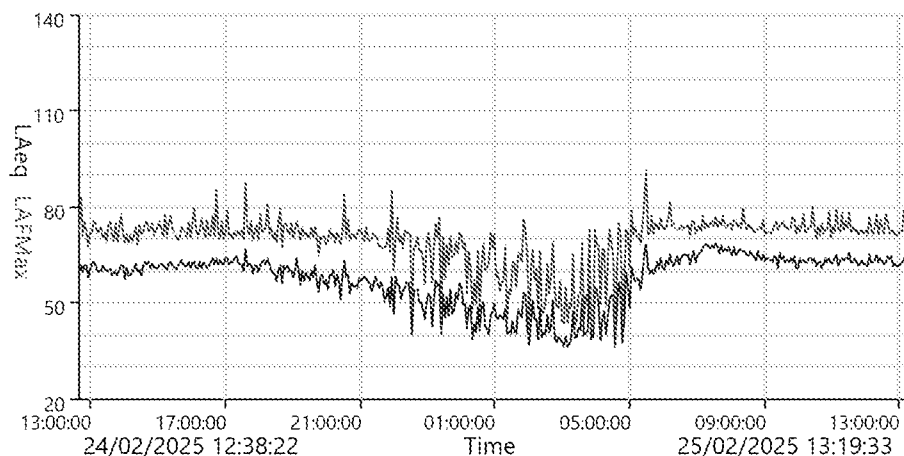
Measurement Summary Report

Name 1
Time 24/02/2025 12:38:22 **Place** **Project**
Duration 1.00:41:11 Barfoots 2025
Instrument G068504, CR:171C

Calibration

Before **Offset** **After** **Offset**

Basic Values		Statistical Levels (Ln)	
L _{Aeq}	61.2 dB	LAF1	70.9 dB
L _{AE}	110.7 dB	LAF5	68.0 dB
L _{AFMax}	91.4 dB	LAF10	65.9 dB
		LAF50	53.5 dB
		LAF90	39.0 dB
		LAF95	37.7 dB
		LAF99	36.0 dB





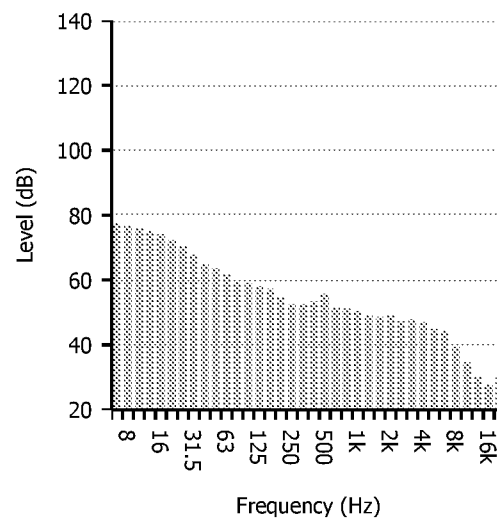
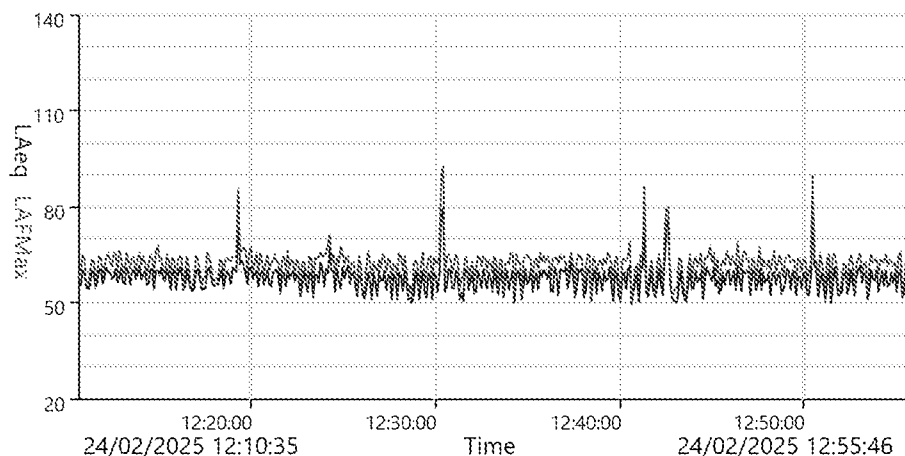
Measurement Summary Report

Name Residual
Time 24/02/2025 12:10:35 **Place** **Project**
Duration 00:45:11 Barfoots 2025
Instrument G068537, CR:171B

Calibration

Before **Offset** **After** **Offset**

Basic Values		Statistical Levels (Ln)	
L _{Aeq}	61.0 dB	LAF1	65.1 dB
L _{AE}	95.4 dB	LAF5	62.1 dB
L _{AFMax}	92.3 dB	LAF10	61.1 dB
		LAF50	57.0 dB
		LAF90	50.9 dB
		LAF95	50.3 dB
		LAF99	49.5 dB



CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 05 December 2024

CERTIFICATE NUMBER 228453

Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2

Approved signatory

N.Smith

Electronically signed:

Sound Level Meter : IEC 61672-3:2006

Instrument information

Manufacturer: Cirrus Research plc

Notes:

Model: CR:171B

Serial number: G068537

Class: 1

Firmware version: 2.4.1569

Test summary

Date of calibration: 05 December 2024

The calibration was performed respecting the requirements of ISO/IEC 17025:2017.

Periodic tests were performed in accordance with procedures from IEC 61672-3:2006.

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.

Notes

This certificate 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. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%.

CERTIFICATE OF CALIBRATION

Certificate Number:

228453

Page 2 of 2

Environmental conditions

The following conditions were recorded at the time of the test:

Before Pressure: 99.31 kPa Temperature: 23.2 °C Humidity: 36.2 %
 After Pressure: 99.23 kPa Temperature: 23.2 °C Humidity: 36.3 %

Test equipment

Equipment	Manufacturer	Model	Serial number
Signal Generator	KEYSIGHT	33511B	MY58001613
Attenuator	Cirrus Research	ZE:952	64370
Environmental Monitor	Comet	T7310	24792823
Acoustic Calibrator	Bruel and Kjaer	4231	2263293

Additional instrument information

Instruction manual:

Reference level range: Single range

Pattern approval: Yes

Source of pattern approval: PTB

Preamplifier

Model: MV:200F

Serial number: 4204F

Microphone

Model: MK:224

Serial number: 201385A

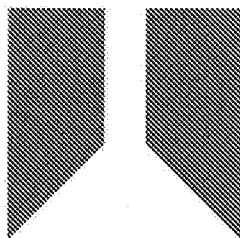
Test results summary

Test	Result
Toneburst response	Complies
Electrical noise-floor	Complies
Linearity	Complies
Electrical Frequency weightings	Complies
Frequency and time weightings at 1 kHz	Complies
C-weighted peak	Complies
Overload indication	Complies
Acoustic Frequency weightings	Complies

CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 29 November 2024 CERTIFICATE NUMBER 228454



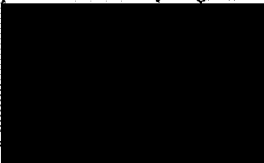
Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2

Test engineer:

D.Swalwell

Electronically signed:



Microphone

Microphone capsule

Manufacturer: Cirrus Research plc

Model: MK224

Serial Number: 201385A

Calibration procedure

Date of calibration: 29 November 2024

Open circuit: 44.9 mV/Pa

Sensitivity at 1 kHz: -26.9 dB rel 1 V/Pa

The microphone capsule detailed above has been calibrated to the published data as described in the operating manual of the associated sound level meter (where applicable).

The frequency response was measured using an electrostatic actuator in accordance with BS EN 61094-6:2005 with the free-field response derived via standard correction data traceable to a National Measurement Institute.

The absolute sensitivity at 1 kHz was measured using an acoustic calibrator conforming to IEC 60942:2003 Class 1.

Environmental conditions

Pressure: 101.70 kPa

Temperature: 21.0 °C

Humidity: 31.0 %

CERTIFICATE OF CALIBRATION

Certificate Number:

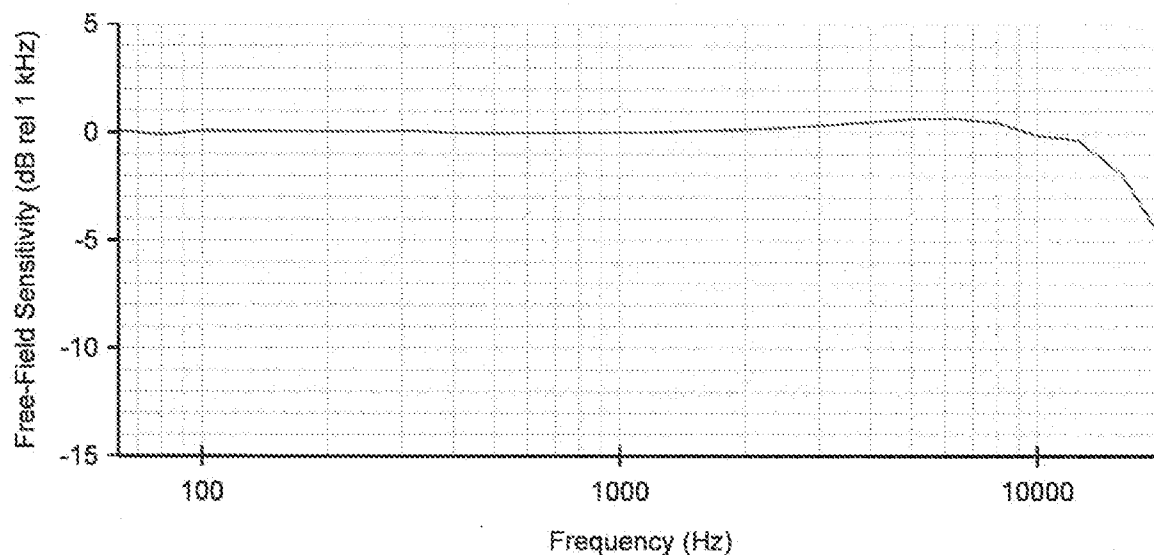
228454

Page 2 of 2

Free-Field Frequency Response : Tabular

Frequency (Hz)	Free-Field Sensitivity (dB rel 1 kHz)	Actuator Response (dB)
63	0.07	-0.14
80	-0.13	-0.23
100	0.06	0.00
125	0.05	0.02
160	0.05	0.05
200	0.01	0.03
250	0.02	0.04
315	0.06	0.05
400	-0.03	-0.02
500	-0.05	-0.05
630	-0.02	-0.02
800	-0.00	-0.02
1 000	0.00	-0.02
1 250	0.03	-0.03
1 600	0.07	-0.05
2 000	0.14	-0.08
2 500	0.23	-0.11
3 150	0.34	-0.23
4 000	0.50	-0.40
5 000	0.62	-0.74
6 300	0.66	-1.41
8 000	0.47	-2.69
10 000	-0.13	-4.76
12 500	-0.34	-6.86
16 000	-1.97	-9.93
20 000	-4.97	-14.09

Free-Field Frequency Response : Graphical



CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 04 December 2023 CERTIFICATE NUMBER 204160



Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2

Approved signatory

C.Scott

Electronically signed:



Third-octave-band filter : IEC 61260:1995

Instrument information

Manufacturer: Cirrus Research plc

Notes:

Model: CR171B

Serial number: G068637

Class: 1

Firmware version: 2.4.1589

Test summary

Date of calibration: 04 December 2023

The calibration was performed respecting the requirements of ISO/IEC 17025:2017.

Periodic tests were performed in accordance with procedures from IEC 61260:1995.

The filter submitted for testing successfully completed the Relative Attenuation test of IEC 61260:1995 for the environmental conditions under which the test was performed.

Notes

It provides traceability of measurement to the SI system of units and/or to units of measurement realised at a recognised national metrology institute. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%.

CERTIFICATE OF CALIBRATION

Certificate Number:

204160

Page 2 of 2

Environmental conditions

The following conditions were recorded at the time of the test:

Before Pressure: 99.28 kPa Temperature: 21.1 °C Humidity: 41.0 %

After Pressure: 99.27 kPa Temperature: 21.1 °C Humidity: 41.4 %

Test equipment

Equipment	Manufacturer	Model	Serial number
Signal Generator	TTI	TG4001	327881
Attenuator	Cirrus Research	ZE 952	93890
Environmental Monitor	Comet	T7510	16966334

Filters information

Filter class: 1

Filter base: 2

Reference attenuation: 0.0 dB

Additional instrument information

Instruction manual:

Pattern approval: Yes

Source of pattern approval: PTB

Reference level range: Single range

Laboratory uncertainties

Requirement	Value (dB)
Relative Attenuation High	0.41
Relative Attenuation Mid	0.18
Relative Attenuation Low	0.12

CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 04 December 2023 CERTIFICATE NUMBER 204159



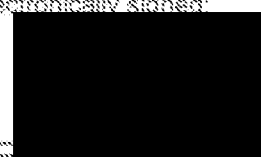
Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2

Approved signatory

C.Scott

Electronically signed:



Octave-band filter : IEC 61260:1995

Instrument information

Manufacturer: Cirrus Research plc

Notes:

Model: CR.171B

Serial number: G068837

Class: 1

Firmware version: 2.4.1589

Test summary

Date of calibration: 04 December 2023

The calibration was performed respecting the requirements of ISO/IEC 17025:2017.

Periodic tests were performed in accordance with procedures from IEC 61260:1995.

The filter submitted for testing successfully completed the Relative Attenuation test of IEC 61260:1995 for the environmental conditions under which the test was performed.

Notes

It provides traceability of measurement to the SI system of units and/or to units of measurement realised at a recognised national metrology institute. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%.

CERTIFICATE OF CALIBRATION

Certificate Number:

204159

Page 2 of 2

Environmental conditions

The following conditions were recorded at the time of the test:

Before Pressure: 99.26 kPa Temperature: 21.1 °C Humidity: 41.0 %

After Pressure: 99.27 kPa Temperature: 21.1 °C Humidity: 41.4 %

Test equipment

Equipment	Manufacturer	Model	Serial number
Signal Generator	TTI	TG4001	327681
Attenuator	Cirrus Research	ZE:952	93890
Environmental Monitor	Comet	T7510	16966334

Filters information

Filter class: 1

Filter base: 2

Reference attenuation: 0.0 dB

Additional instrument information

Instruction manual:

Pattern approval: Yes

Source of pattern approval: PTB

Reference level range: Single range

Laboratory uncertainties

Requirement	Value (dB)
Relative Attenuation High	0.41
Relative Attenuation Mid	0.18
Relative Attenuation Low	0.12

CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 05 December 2024

CERTIFICATE NUMBER 228420



Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2

Approved signatory

N.Smith

Electronically signed:

Sound Level Meter : IEC 61672-3:2013

Instrument information

Manufacturer: Cirrus Research plc

Notes:

Model: CR:171C

Serial number: G068504

Class: 1

Firmware version: 3.3.3386

Test summary

Date of calibration: 05 December 2024

The calibration was performed respecting the requirements of ISO/IEC 17025:2017.

Periodic tests were performed in accordance with procedures from IEC 61672-3:2013.

The sound level meter submitted for testing successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 because (a) evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to determine that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Notes

This certificate 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. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%.

CERTIFICATE OF CALIBRATION

Certificate Number:

228420

Page 2 of 2

Environmental conditions

The following conditions were recorded at the time of the test:

Before	Pressure: 99.47 kPa	Temperature: 23.0 °C	Humidity: 37.1 %
After	Pressure: 99.42 kPa	Temperature: 23.1 °C	Humidity: 36.4 %

Test equipment

Equipment	Manufacturer	Model	Serial number
Signal Generator	KEYSIGHT	33511B	MY58001613
Attenuator	Cirrus Research	ZE:952	64370
Environmental Monitor	Comet	T7310	24792823
Acoustic Calibrator	Cirrus Research plc	CR.511E	33051

Additional instrument information

Instruction manual:

Reference level range: Single range

Pattern approval: No

Source of pattern approval: -

Preamplifier

Model: MV.200F

Serial number: 3980F

Microphone

Model: MK:224

Serial number: 202161A

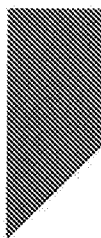
Test results summary

Test	Result
Toneburst response	Complies
Electrical noise-floor	Complies
Linearity	Complies
Electrical Frequency weightings	Complies
Frequency and time weightings at 1 kHz	Complies
C-weighted peak	Complies
Overload indication	Complies
High level stability	Complies
Long-term stability	Complies
Acoustic Frequency weightings	Complies

CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 29 November 2024 CERTIFICATE NUMBER 228419



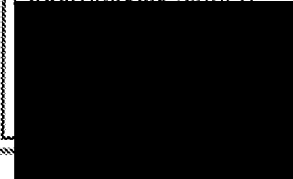
Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2

Test engineer:

D.Swalwell

Electronically signed:



Microphone

Microphone capsule

Manufacturer: Cirrus Research plc

Model: MK:224

Serial Number: 202161A

Calibration procedure

Date of calibration: 29 November 2024

Open circuit: 41.8 mV/Pa

Sensitivity at 1 kHz: -27.6 dB rel 1 V/Pa

The microphone capsule detailed above has been calibrated to the published data as described in the operating manual of the associated sound level meter (where applicable).

The frequency response was measured using an electrostatic actuator in accordance with BS EN 61094-6:2005 with the free-field response derived via standard correction data traceable to a National Measurement Institute.

The absolute sensitivity at 1 kHz was measured using an acoustic calibrator conforming to IEC 60942:2003 Class 1.

Environmental conditions

Pressure: 101.70 kPa

Temperature: 21.0 °C

Humidity: 31.0 %

CERTIFICATE OF CALIBRATION

Certificate Number:

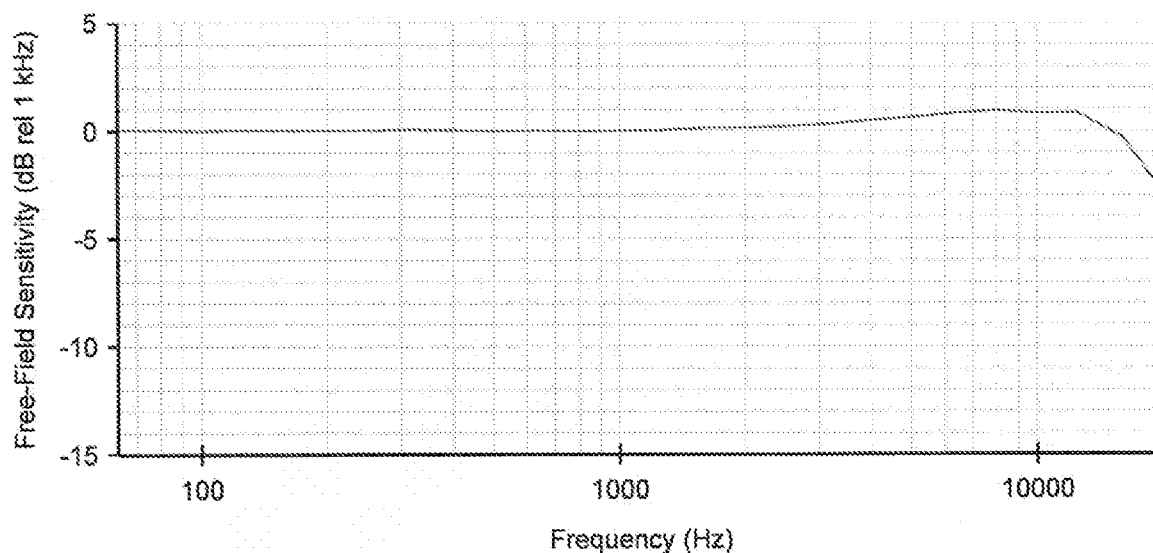
228419

Page 2 of 2

Free-Field Frequency Response : Tabular

Frequency (Hz)	Free-Field Sensitivity (dB rel 1 kHz)	Actuator Response (dB)
63	0.03	-0.13
80	0.01	-0.05
100	-0.02	0.01
125	0.03	0.06
160	0.01	0.06
200	-0.00	0.07
250	0.01	0.09
315	0.05	0.10
400	0.03	0.10
500	-0.02	0.04
630	0.01	0.06
800	-0.02	0.02
1 000	0.00	0.02
1 250	0.01	0.00
1 600	0.10	0.01
2 000	0.12	-0.06
2 500	0.19	-0.13
3 150	0.28	-0.26
4 000	0.46	-0.44
5 000	0.60	-0.76
6 300	0.79	-1.30
8 000	0.91	-2.26
10 000	0.79	-3.88
12 500	0.81	-5.61
16 000	-0.34	-8.15
20 000	-2.91	-11.92

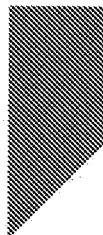
Free-Field Frequency Response : Graphical



CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 05 December 2024 CERTIFICATE NUMBER 228421



Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2

Approved signatory

N.Smith

Electronically signed:

Third-octave-band filter : IEC 61260:1995

Instrument Information

Manufacturer: Cirrus Research plc

Notes:

Model: CR:171C

Serial number: G068504

Class: 1

Firmware version: 3.3.3386

Test summary

Date of calibration: 05 December 2024

The calibration was performed respecting the requirements of ISO/IEC 17025:2017.

Periodic tests were performed in accordance with procedures from IEC 61260:1995.

The filter submitted for testing successfully completed the Relative Attenuation test of IEC 61260 for the environmental conditions under which the test was performed.

Notes

It provides traceability of measurement to the SI system of units and/or to units of measurement realised at a recognised national metrology institute. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%.

CERTIFICATE OF CALIBRATION

Certificate Number:

228421

Page 2 of 2

Environmental conditions

The following conditions were recorded at the time of the test:

Before Pressure: 99.47 kPa Temperature: 23.0 °C Humidity: 37.1 %

After Pressure: 99.42 kPa Temperature: 23.1 °C Humidity: 36.4 %

Test equipment

Equipment	Manufacturer	Model	Serial number
Signal Generator	KEYSIGHT	33511B	MY58001613
Attenuator	Cirrus Research	ZE-952	64370
Environmental Monitor	Comet	T7310	24792823
Acoustic Calibrator	Cirrus Research plc	CR-511E	33051

Filters information

Filter class: 1

Filter base: 2

Reference attenuation: 0.0 dB

Additional instrument information

Instruction manual:

Pattern approval: No

Source of pattern approval: -

Reference level range: Single range

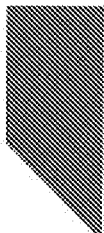
Laboratory uncertainties

Requirement	Value (dB)
Relative Attenuation High	0.41
Relative Attenuation Mid	0.18
Relative Attenuation Low	0.12

CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 05 December 2024 CERTIFICATE NUMBER 228422



Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2

Approved signatory

N.Smith

Electronically signed:

Octave-band filter : IEC 61260:1995

Instrument information

Manufacturer: Cirrus Research plc

Notes:

Model: CR.171C

Serial number: G068504

Class: 1

Firmware version: 3.3.3386

Test summary

Date of calibration: 05 December 2024

The calibration was performed respecting the requirements of ISO/IEC 17025:2017.

Periodic tests were performed in accordance with procedures from IEC 61260:1995.

The filter submitted for testing successfully completed the Relative Attenuation test of IEC 61260 for the environmental conditions under which the test was performed.

Notes

It provides traceability of measurement to the SI system of units and/or to units of measurement realised at a recognised national metrology institute. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%.

CERTIFICATE OF CALIBRATION

Certificate Number:

228422

Page 2 of 2

Environmental conditions

The following conditions were recorded at the time of the test:

Before Pressure: 99.47 kPa Temperature: 23.0 °C Humidity: 37.1 %

After Pressure: 99.42 kPa Temperature: 23.1 °C Humidity: 36.4 %

Test equipment

Equipment	Manufacturer	Model	Serial number
Signal Generator	KEYSIGHT	33511B	MY58001613
Attenuator	Cirrus Research	ZE:952	64370
Environmental Monitor	Comet	T7310	24792823
Acoustic Calibrator	Cirrus Research plc	CR:511E	33051

Filters information

Filter class: 1

Filter base: 2

Reference attenuation: 0.0 dB

Additional instrument information

Instruction manual:

Pattern approval: No

Source of pattern approval: -

Reference level range: Single range

Laboratory uncertainties

Requirement	Value (dB)
Relative Attenuation High	0.41
Relative Attenuation Mid	0.18
Relative Attenuation Low	0.12