



PREPARED: 25 April 2025

Blue Boar Row, Salisbury

Noise Impact Assessment

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LIST OF ATTACHMENTS

AS14019/SP1	Indicative Site Plan
AS14019/TH1-TH28	Environmental Noise Time Histories
APPENDIX A	Acoustic Terminology

Project Ref:	AS14019	Project Name:	47 Blue Boar Row, Salisbury
Report Ref:	AS14019.250401.R1	Report Title:	Noise Impact Assessment
Client Name:	Atlas Planning Group		
Project Manager:	Michael Symmonds		
Report Author:	Michael Symmonds		
Clarke Saunders Acoustics Winchester SO22 5BE		This report has been prepared in response to the instructions of our client. It is not intended for and should not be relied upon by any other party or for any other purpose.	

1.0 EXECUTIVE SUMMARY

- 1.1 Clarke Saunders Acoustics has assessed the noise environment in the vicinity of 47 Blue Boar Row, Salisbury, SP1 1DA. This assessment has been conducted to determine the site's suitability for residential use.
- 1.2 Where glazing is retained on the Blue Boar Row façade, new secondary glazed systems should be installed. These systems would result in external noise intrusion being controlled to below the desirable targets, also providing a good level of low frequency control, protecting against the bus engine noise.
- 1.3 These secondary glazed systems would allow a plenum-type window opening to be provided, where laboratory test data shows that a suitable external to internal level reduction can be achieved.
- 1.4 The good acoustic design feature of locating bedrooms to the rear results in sufficiently low noise levels such that secondary glazing should not be required. The windows could be open whilst maintaining desirable internal noise levels.
- 1.5 The building can be made acoustically suitable for residential use, where the noise sources in the area should not result in adverse impact on the future occupiers of the development.

2.0 INTRODUCTION

- 2.1 Clarke Saunders Acoustics (CSA) has been commissioned to undertake a noise impact assessment at 47 Blue Boar Row, Salisbury, SP1 1DA (the site), to determine its suitability for residential use.
- 2.2 As the site is a Grade II Listed Building, the assessment has considered the performance of the existing glazed elements and acoustic requirement for secondary glazing.
- 2.3 Environmental noise survey data will be recorded at the site, which will be used to quantify the noise climate and allow the relevant noise sources to be assessed. The primary noise sources requiring consideration are those from bus stops N and O, and Salisbury Market.
- 2.4 A summary of the acoustic terminology used throughout this report is provided at Appendix A.

3.0 SITE DESCRIPTION

3.1 SURROUNDING AREA

- 3.1.1 The site is located in the centre of Salisbury, surrounded by a mixture of commercial and residential buildings. Its front façade faces onto Blue Boar Row.
- 3.1.2 Approximately 15-20m south of the Blue Boar Row façade lies Guildhall Square, where Salisbury Market operates between 08:00 and 15:30 hours every Tuesday, and 08:00 and 16:00 hours every Saturday.
- 3.1.3 Bus stops N and O are located directly outside the front façade with scheduled services running between 05:15 hours and 23:25 hours.

- 3.1.4 The soundscape of the area is primarily determined by road traffic noise, particularly that from buses serving the adjacent bus stops.
- 3.1.5 The attached site plan AS14019/SP1 shows the site and its surrounding area.

3.2 PROPOSED LAYOUTS

- 3.2.1 The proposed site layouts indicate that good acoustic design has been incorporated into the scheme, with bedrooms located toward the rear of the building, sheltered from the road traffic noise sources. Living rooms, kitchens and bathrooms are located on the Blue Boar Row façade.
- 3.2.2 Some of the proposed second-floor bedrooms have line of sight to rooftop plant on the adjacent commercial buildings. It is not anticipated that these units will operate during the night, on the basis of the environmental noise survey data and the opening hours of the associated businesses.

4.0 COMPETENCE

- 4.1 This project has been managed by Michael Symmonds, a Senior Consultant at Clarke Saunders Acoustics (CSA), who is also the author of this report.
- 4.2 Michael Symmonds holds a Master's degree in Acoustical Engineering, obtained from the Institute of Sound and Vibration Research at the University of Southampton. He has over seven years of experience in the consultancy field and is a Corporate Member of the Institute of Acoustics.
- 4.3 The environmental noise survey was undertaken by Joel Bird, an Assistant Consultant at CSA under the supervision of Michael Symmonds.
- 4.4 Joel Bird holds a Master's degree in Acoustical Engineering, obtained from the Institute of Sound and Vibration Research at the University of Southampton. He is an Associate Member of the Institute of Acoustics.
- 4.5 The report adheres with the principles required by the Institute of Acoustics in their Code of Conduct, and the work is within the author's own area of knowledge and expertise. Where opinions have been expressed these represent true and complete professional opinions on the matters to which they refer.
- 4.6 CSA is a full member of the Association of Noise Consultants (ANC). The author of this report is a Corporate Member of the Institute of Acoustics.

5.0 LOCAL AUTHORITY REQUIREMENTS AND GUIDANCE

5.1 WILTSHIRE COUNCIL

- 5.1.1 In 2023 Wiltshire Council published a technical guidance document titled *Planning Consultation Guidance Notice – Noise and Vibration*, which provides guidance regarding noise and vibration criteria for project requiring planning permission.
- 5.1.2 Section 6.3 *Residential Developments* of this document states the following:

Where mitigation schemes involving noise insulation are provided for industrial, commercial or entertainment noise sources or where secondary glazing is specified, ECP may require commissioning testing of the insulation scheme prior to occupation. Where commissioning testing is required, it shall demonstrate that:

1. *The building envelope achieves the approved sound reduction performance, and*
2. *the internal noise environment to habitable rooms shall (under all conditions of the test) meet:*
 - a. *the proposed noise criteria of the scheme,*
 - b. *the daytime and night-time internal noise level criteria requirements detailed in section 7 and in particular Table 4 of British Standard 8233:2014 ‘Guidance on sound insulation and noise reduction for buildings’,*
 - c. *the 2017 ProPG on Planning and Noise – ‘New residential developments’, and*
 - d. *the requirements of this document.*

5.1.3 Section 6.4 Noise from road and rail transport impacting new residential developments states the following:

Internal noise levels should be calculated using the methods provided in BS 8233:2014 and/or BS EN 12354:3. In accordance with the ProPG and the hierarchy in section 5 of this document the acoustic design scheme shall aim to achieve the internal noise levels with windows open.

Where openable windows are provided ECP will not accept a strategy that relies on the occupier of the noise sensitive premises having to close the window during noisy activities other than for noise without character such as transportation noise. Closed windows to mitigate transport noise will only be considered if all other reasonable measures in the hierarchy have been utilised and only for an absolute minimum of rooms. Designs that result in whole dwellings needing windows close to mitigate transport noise will not be accepted.

5.2 BS8233 AND WHO

5.2.1 BS8233:2014 *Guidance on sound insulation and noise reduction for buildings* provides guidance on suitable IANLs for various types of buildings.

5.2.2 Table 4 (reproduced below) of the standard provides recommended levels for steady external noise sources in dwellings.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB LAeq,16hour	-
Dining	Dining room/area	40 dB LAeq,16hour	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16hour	30 dB LAeq,16hour

Table 5.1: Indoor ambient noise levels for dwellings

- 5.2.3 The World Health Organisation *Guidelines for Community Noise (2000)* (WHO) suggests that noise maxima in bedrooms at night should not exceed 45dB L_{Amax} more than 10-15 times per night.

6.0 ENVIRONMENTAL NOISE SURVEY

6.1 EQUIPMENT AND PROCEDURE

- 6.1.1 A survey of the existing ambient noise levels was undertaken at external and internal positions at first and second floor level. The monitoring positions are shown in the appended site plan, AS14019/SP1.
- 6.1.2 The external positions were installed to capture the noise generated by road traffic, including the bus stop on Blue Boar Row, and the plant items located to the west of the site. The internal positions were installed to measure the existing indoor ambient noise levels within proposed bedrooms to the rear and living spaces on the front.
- 6.1.3 The monitors were set to record measurements of consecutive 5-minute L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels between the hours of 13:15 on Thursday 3rd April and 14:30 on Thursday 10th April 2025.
- 6.1.4 The following equipment was used during the survey:

External

- 1 no. Rion Class 1 sound level meter type NL53 (External Position 1);
- 1 no. NTi Audio Class 1 sound level meter type XL2 (External Position 2);

Internal

- 1 no. Rion Class 1 sound level meter type NL52 (Internal Position 1);
- 1 no. Rion Class 1 sound level meter type NL32 (Internal Position 2);

Calibrator

- 1 no. Rion sound level calibrator type NC74.

- 6.1.5 The calibration of the sound level meters was verified before and after use, with no significant calibration drift detected. All equipment has current certified traceable laboratory calibration which is available for inspection on request.
- 6.1.6 Measurements were made following procedures in BS7445:1991 (ISO1996-2:1987) *Description and measurement of environmental noise Part 2-Acquisition of data pertinent to land use*.
- 6.1.7 The weather during the survey period was typically calm with light winds, and as such is considered suitable for the survey.

6.2 RESULTS

6.2.1 Figures AS14019/TH1-TH28 show the L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels as time histories at each of the measurement positions.

6.2.2 The average noise levels for the daytime (07:00 – 23:00 hours) and night-time (23:00 – 07:00 hours) periods are shown in Table 6.1. The external noise levels are free-field values.

Position	Monitoring Period	Average $L_{Aeq,T}$	Typical Highest L_{AFmax}^*
Internal Position 1 (proposed living room)	Daytime	44dB	-
	Night-time	36dB	55dB
Internal Position 2 (proposed bedroom)	Daytime	31dB	-
	Night-time	23dB	43dB
External Position 1	Daytime	62dB	-
	Night-time	53dB	73dB
External Position 2	Daytime	38dB	-
	Night-time	32dB	52dB

Table 6.1: Environmental noise survey results

**90th percentile of the L_{AFmax} dataset*

6.2.3 The noise climate at the site is determined by bus activity and road traffic noise from the surrounding streets.

6.2.4 The average $L_{Aeq,T}$ levels measured at Internal Position 2 achieve the desirable internal noise levels in Table 4. At Internal Position 1 the desirable internal noise levels are exceeded and the front façade would, therefore, need to incorporate mitigation measures, such as secondary glazing.

7.0 DISCUSSION

7.1 As there are no external amenity spaces included in this proposal, this assessment focusses on the internal noise levels. Internal noise level targets have been set to achieve those stated in Table 5.1.

7.2 The levels measured at Internal Position 2, located in a proposed bedroom towards the rear of the building, fall below the desirable targets stated in Table 5.1 and paragraph 5.2.3.

7.3 The levels measured at Internal Position 1, located in a proposed living room on the front façade, are currently elevated above the desirable daytime target stated in Table 5.1.

7.4 By comparing the measured external and internal noise maxima at the front façade, the single figure level difference of the glazing on the front façade is circa 18dB.

- 7.5 Where external noise intrusion is elevated above the desirable levels provided in Table 5.1 and the existing glazing is to be retained, secondary glazing would be required to provide further attenuation to external noise sources.
- 7.6 The low frequency content of the bus engine noise is noted. The installation of secondary glazing provides good opportunity for mitigation of this low frequency noise ingress. The installation of a 6mm thick single glazed panel, circa 100mm from the existing pane, should sufficiently improve the sound reduction such that the desirable internal daytime level would be achieved, also significantly reducing the extent of low frequency bus noise.
- 7.7 Separate consideration has been given to the background ventilation case, where trickle ventilators can be installed.
- 7.8 Table 7.1 presents the required sound reduction performance of the natural ventilation system.

Façade	Performance
Front	$D_{n,e,w}$ 30dB
Rear and Side	open windows

Table 7.1: Ventilator acoustic performance requirements

- 7.9 Windows on the rear and side are exposed to sufficiently low noise levels such that the desirable internal ambient noise levels are likely to be achieved with open windows (assuming an outside to inside level difference of 10dB).
- 7.10 Where the living room windows on the front façade are opened, the primary and secondary panes could form a plenum-type opening, which can provide increased outside to inside attenuation.
- 7.11 On the basis of the external free-field average noise level of $L_{Aeq,16hr}$ 62dB, an outside to inside level difference of 27dB is required. This level difference value is potentially achievable, with reference to information published by specialist suppliers, such as Eilenburger Fenstertechnik.
- 7.12 It should be noted that good acoustic design has been incorporated into the scheme, by locating the bedrooms to the rear. The less noise sensitive living room/kitchen and bathroom areas are located on the loudest façade and, as these rooms are typically larger than bedrooms, the number of rooms on the front façade has been minimised.

8.0 CONCLUSIONS

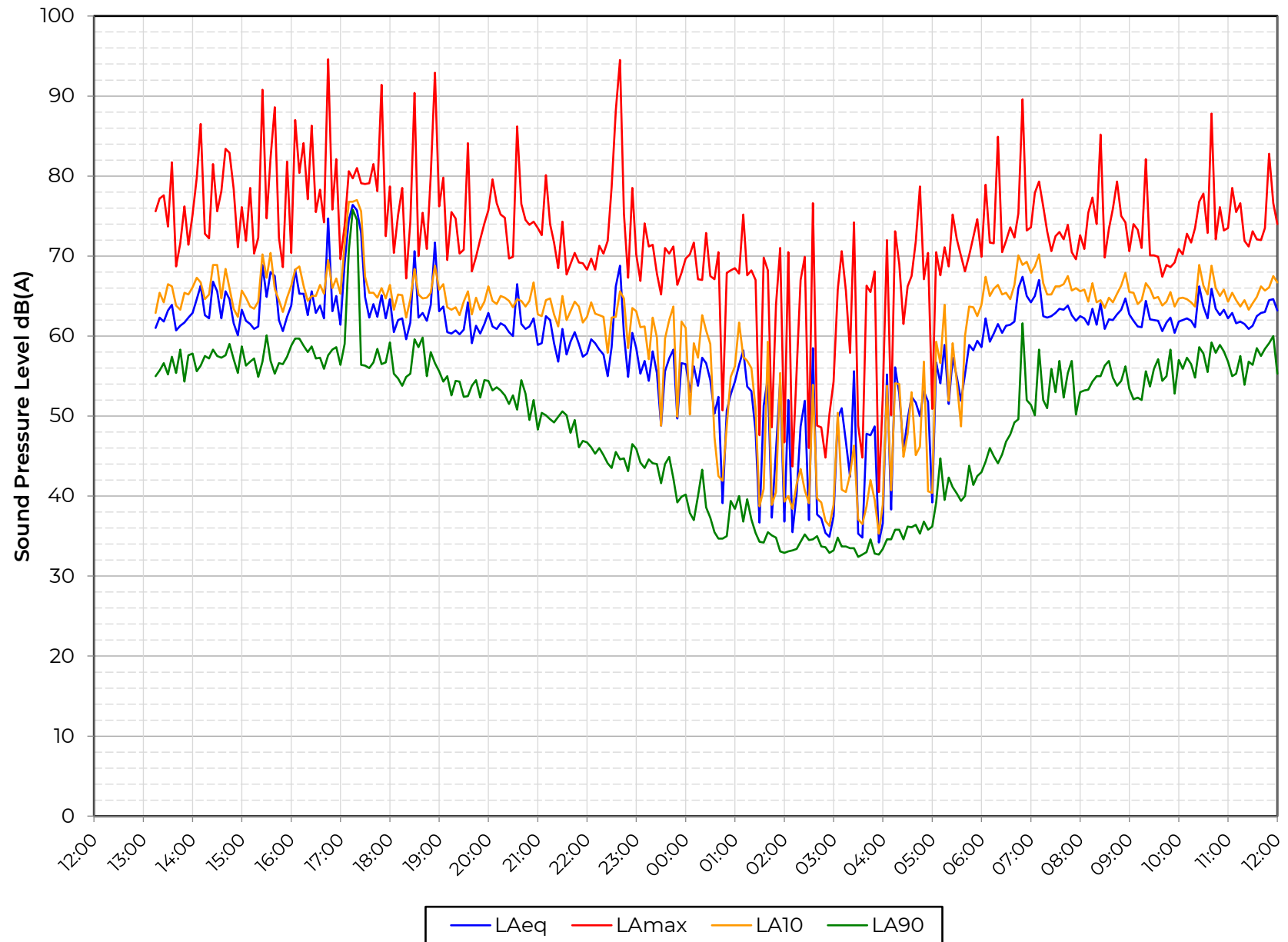
- 8.1 Clarke Saunders Acoustics has conducted an assessment of the noise environment in the vicinity of 47 Blue Boar Row, Salisbury, SP1 1DA. This assessment has been conducted to determine the site's suitability for residential use, referencing the requirements of the local authority and guidelines found in BS8233 and WHO1999 *Guidelines for Community Noise*.
- 8.2 The survey results have indicated that where glazing is retained on the Blue Boar Row façade, new secondary glazed systems should be installed. These systems would result in external noise intrusion being controlled to below the desirable targets, also providing a good level of low frequency control, protecting against the bus engine noise.
- 8.3 These secondary glazed systems would allow a plenum-type window opening to be provided, where laboratory test data shows that a suitable external to internal level reduction can be achieved.
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M Symmonds

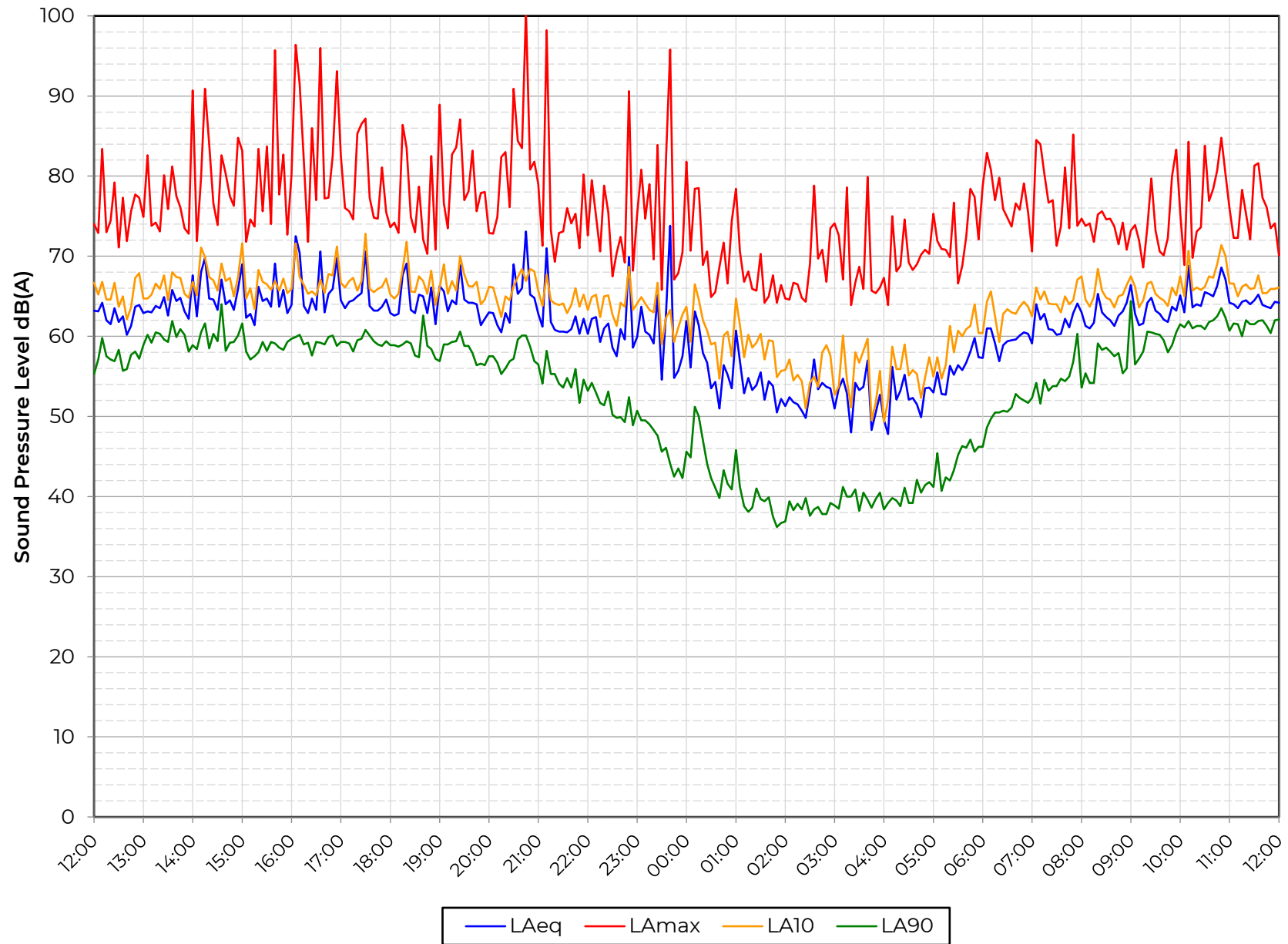
Michael Symmonds MIOA
CLARKE SAUNDERS ACOUSTICS



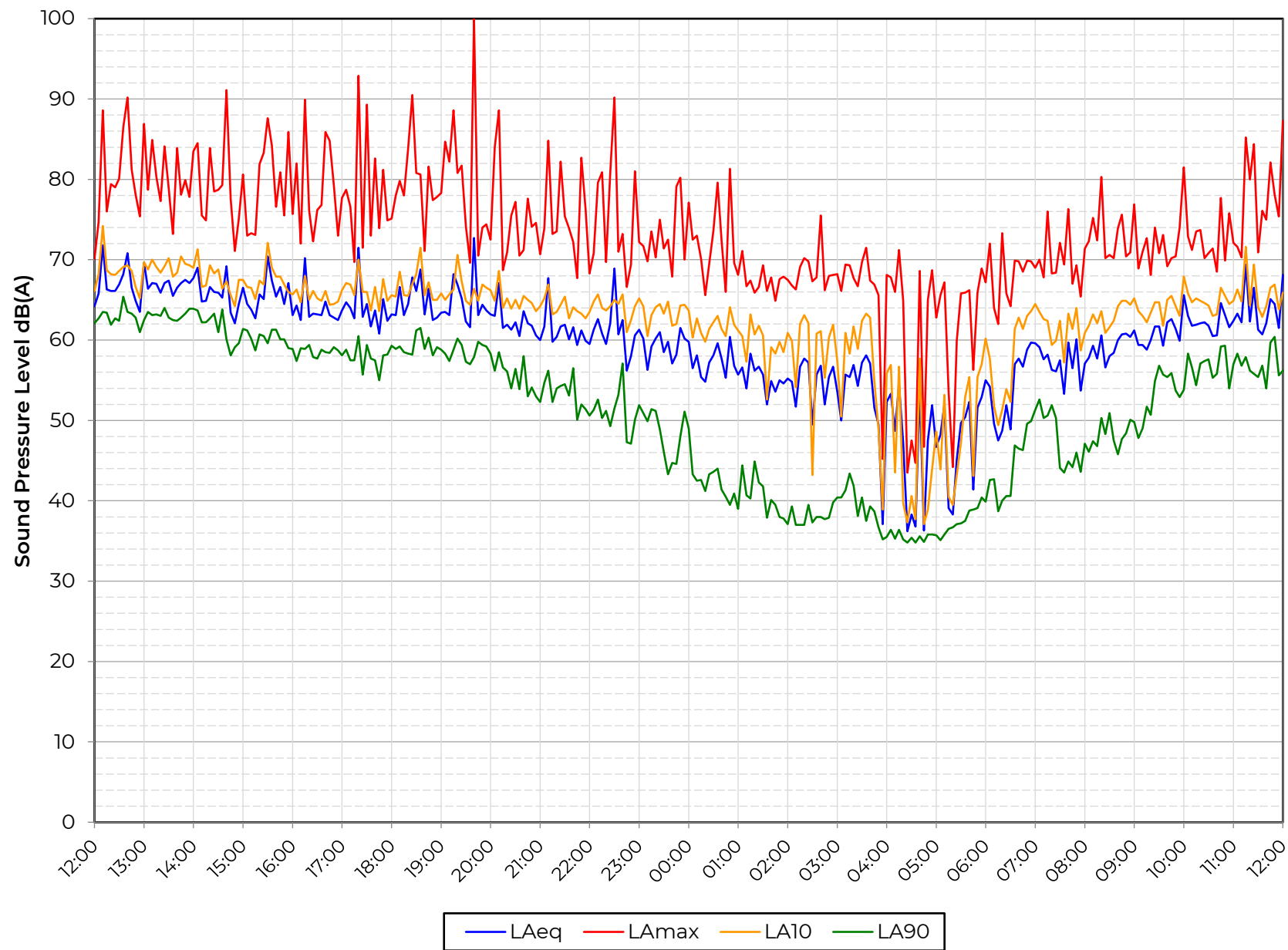
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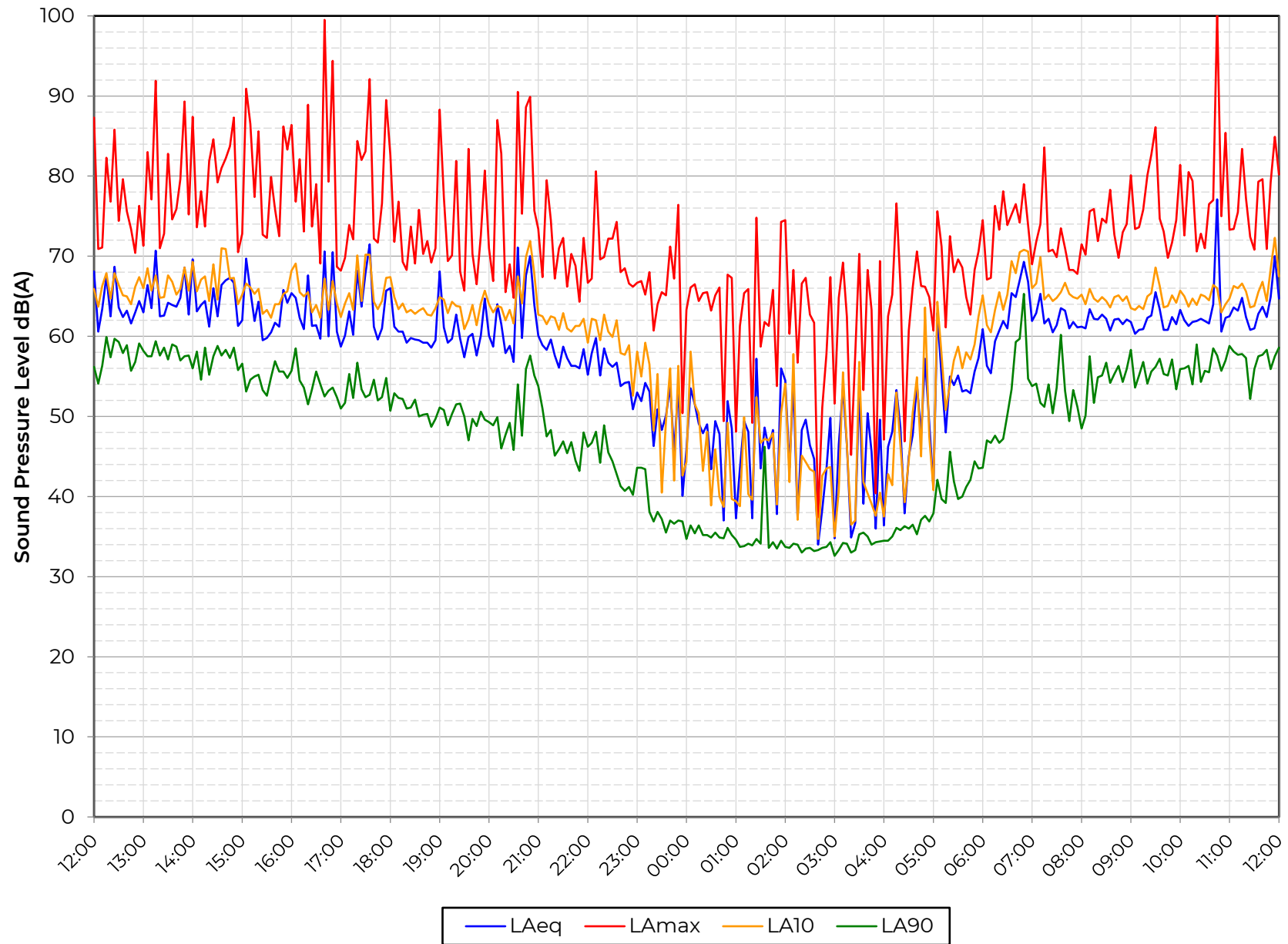
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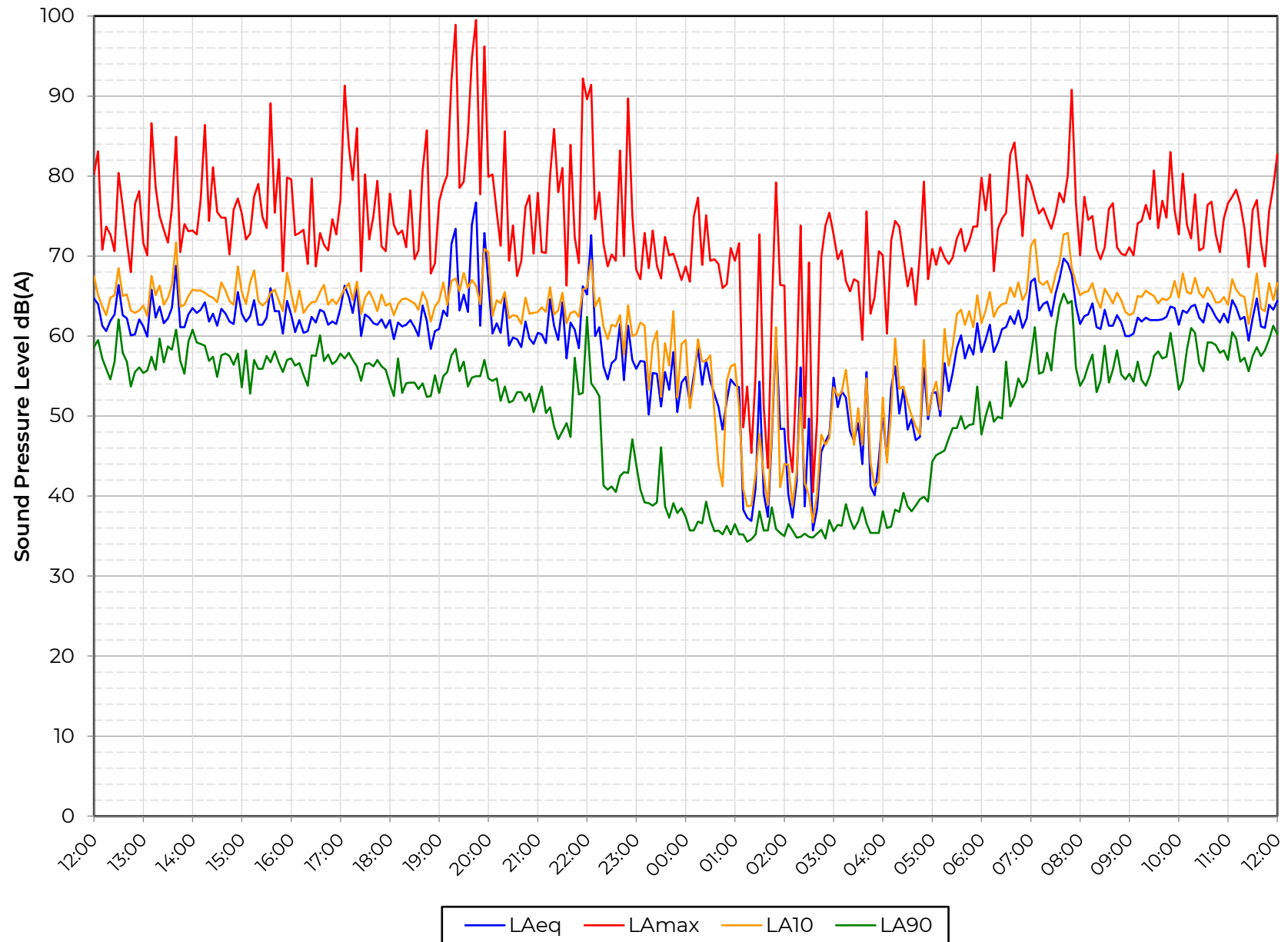
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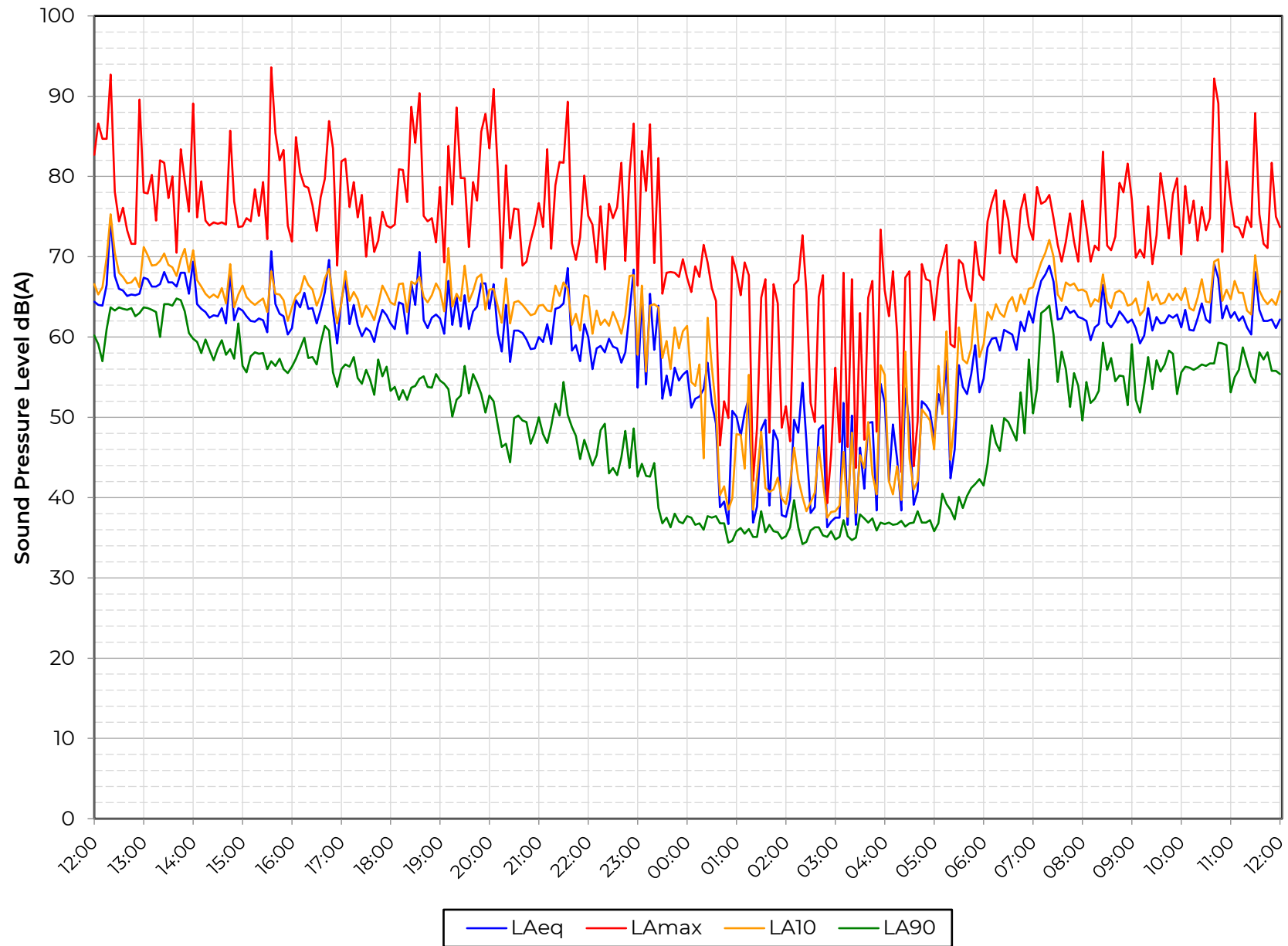
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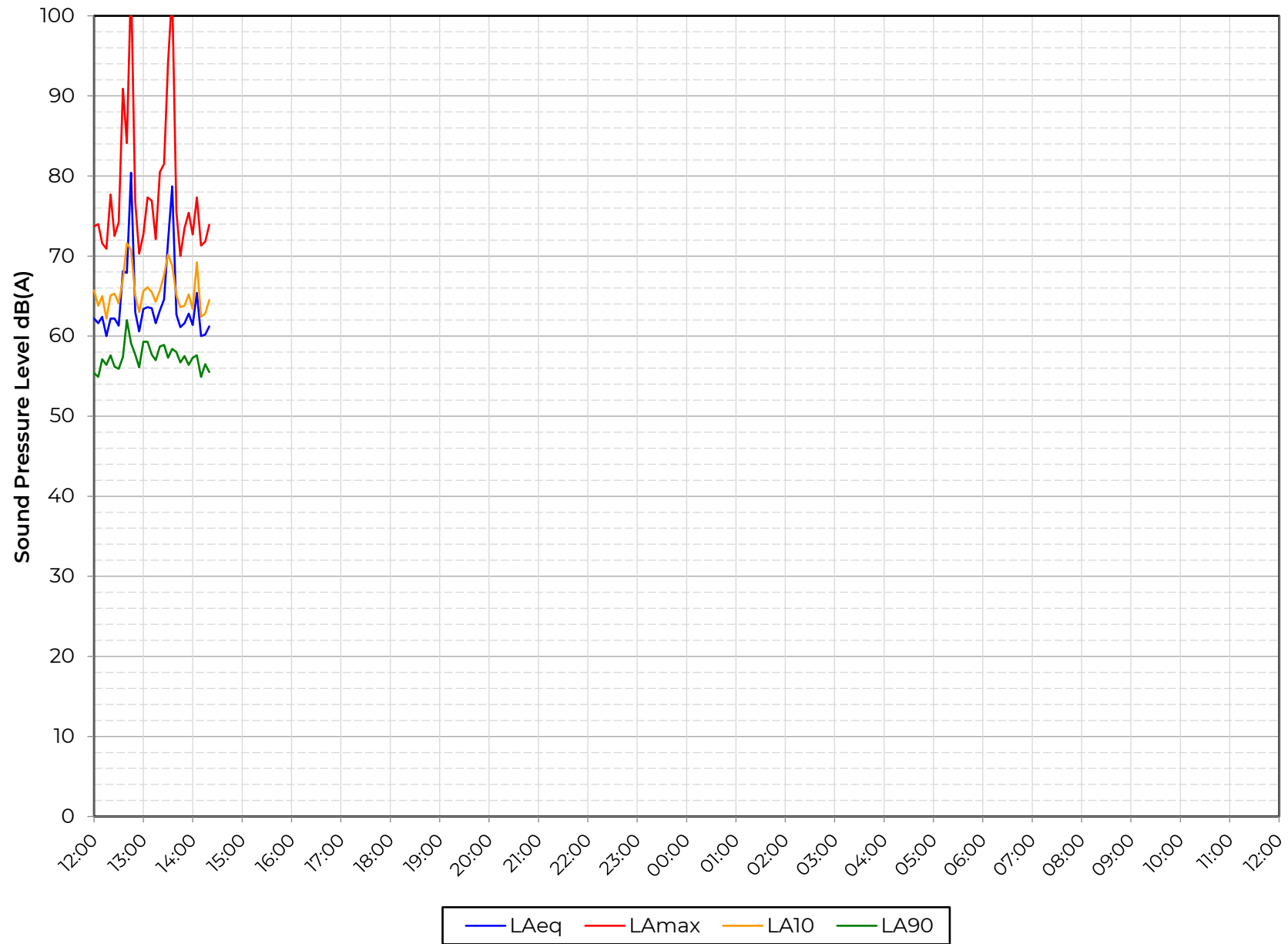
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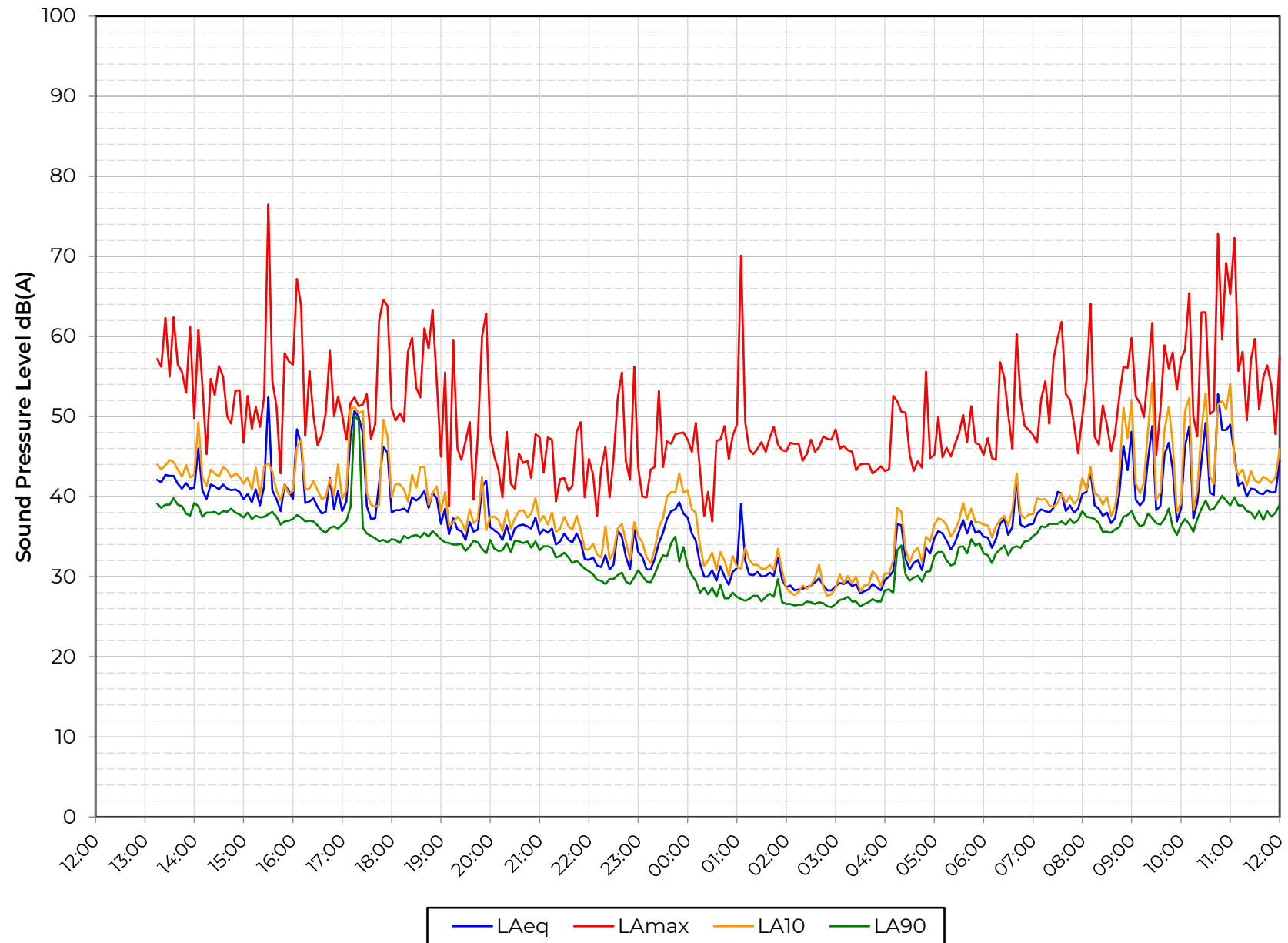
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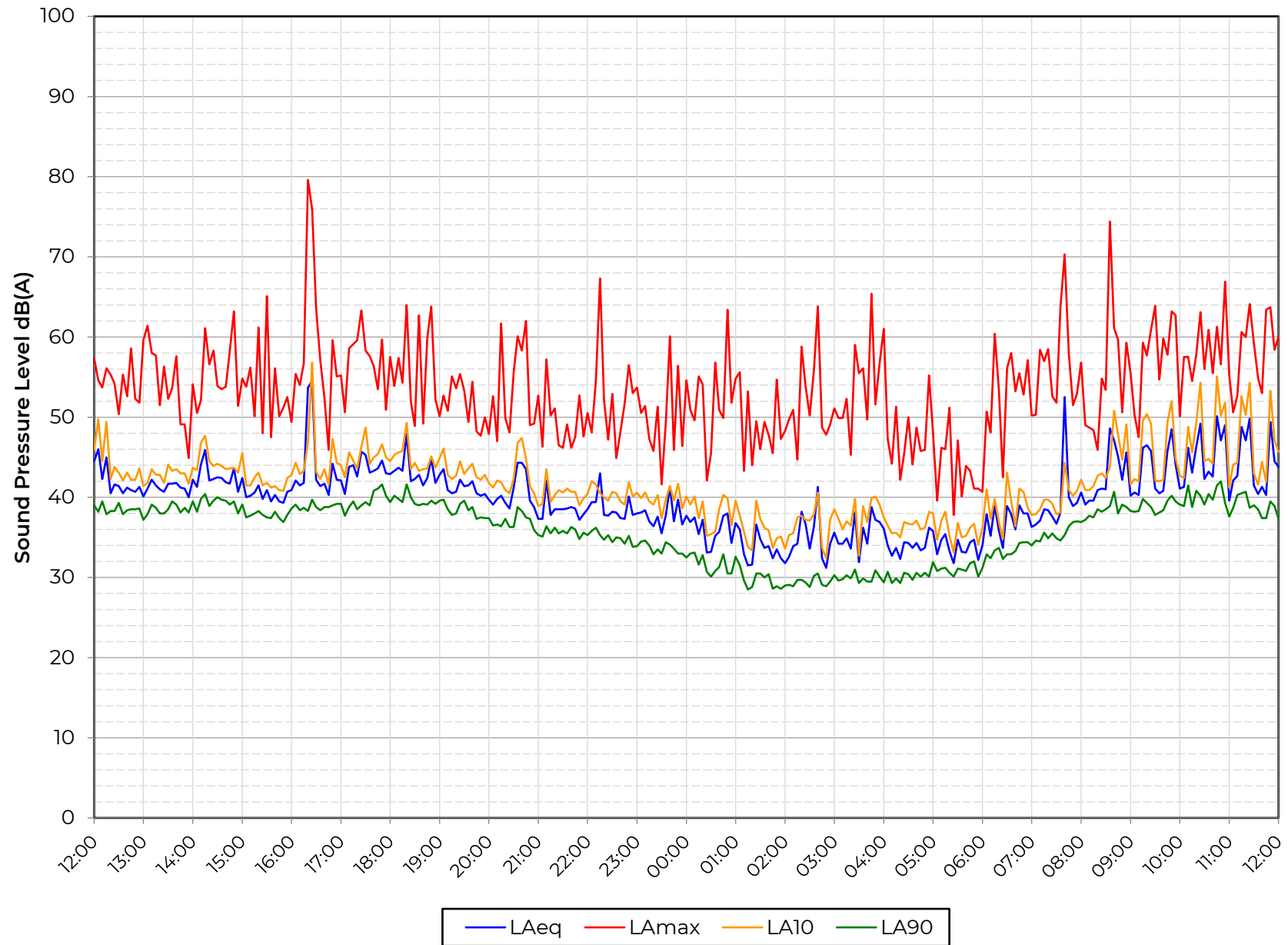
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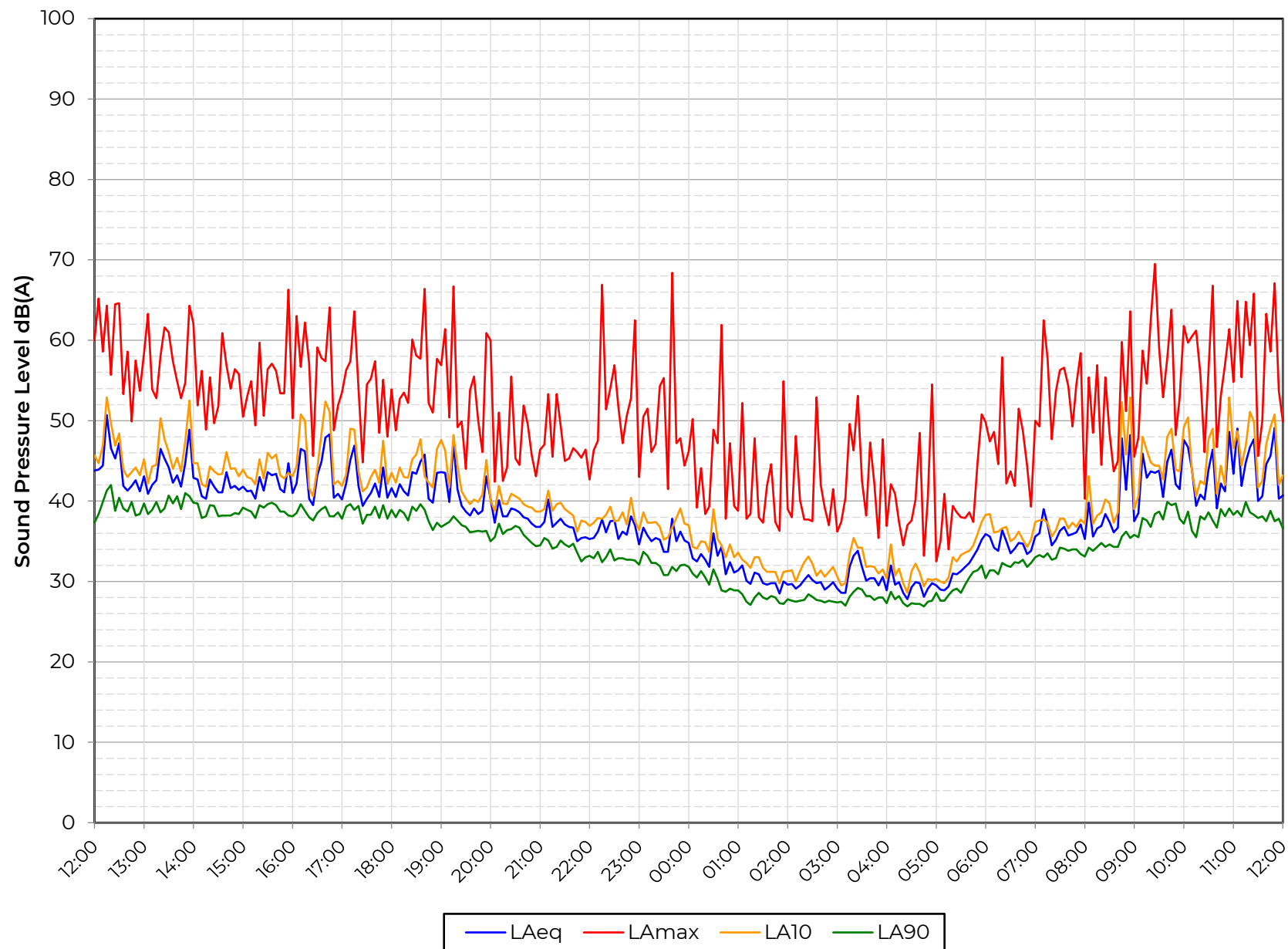
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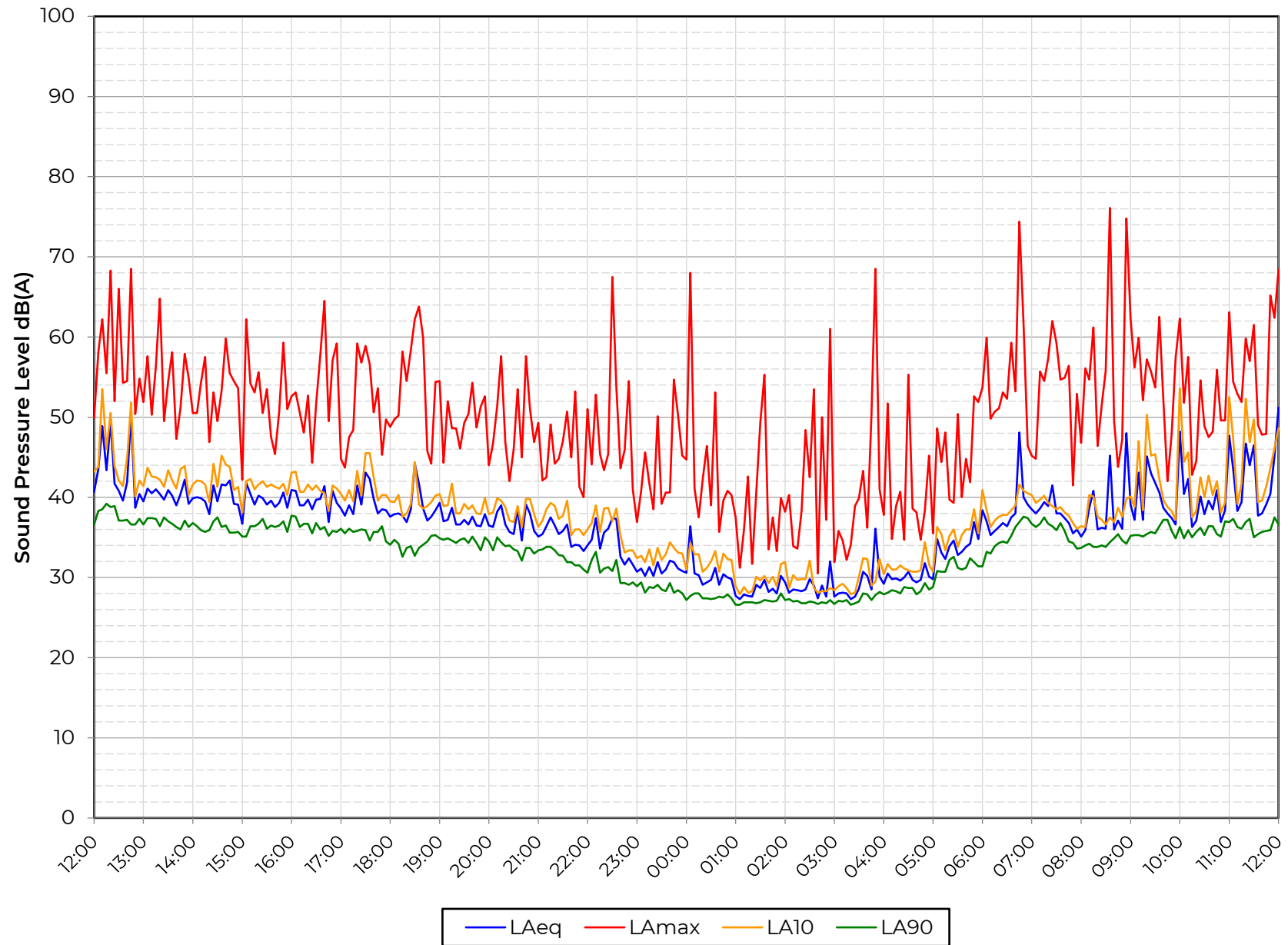
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Position : External 2

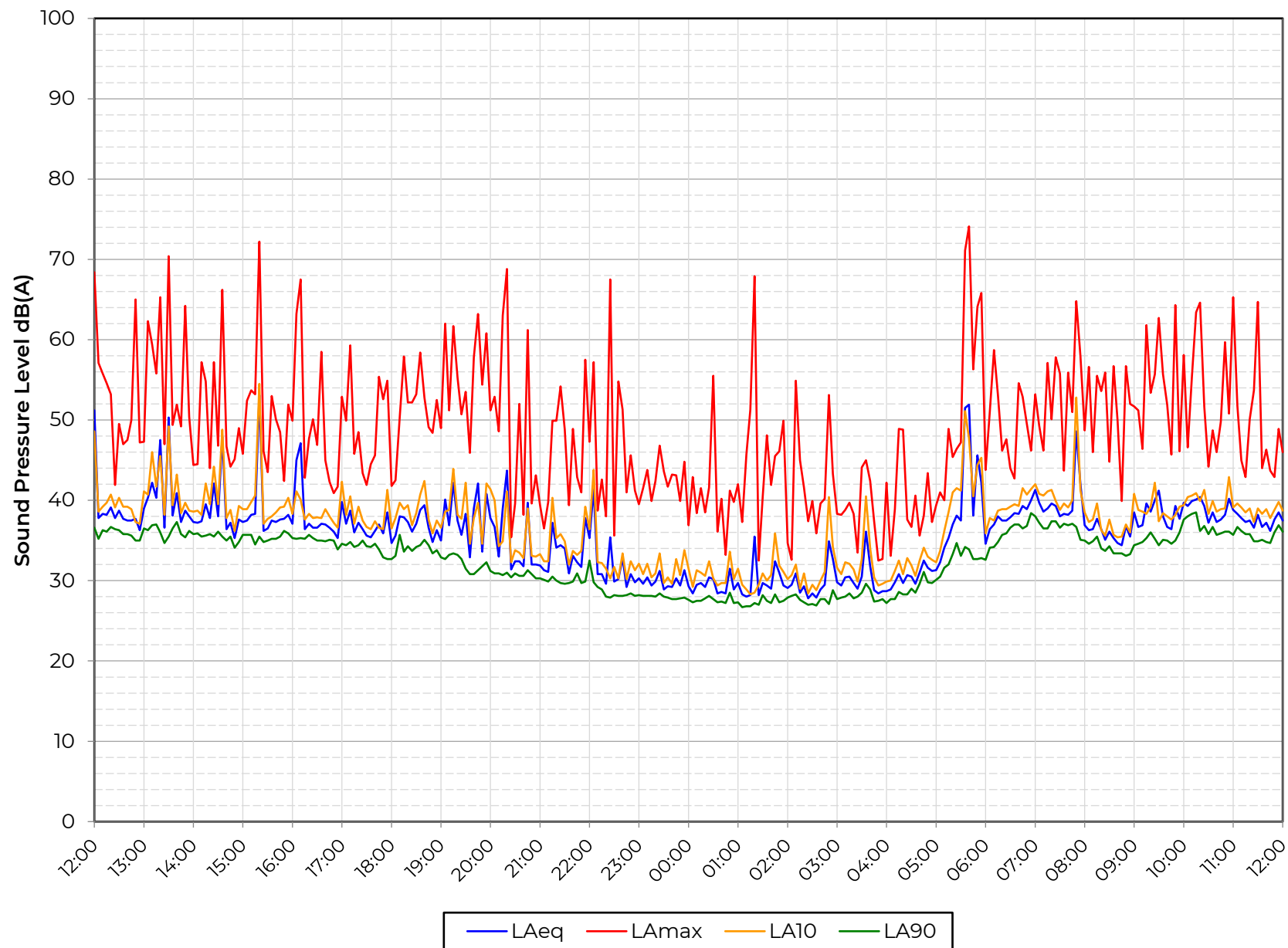


Position : External 2



47 Blue Boar Row, Salisbury

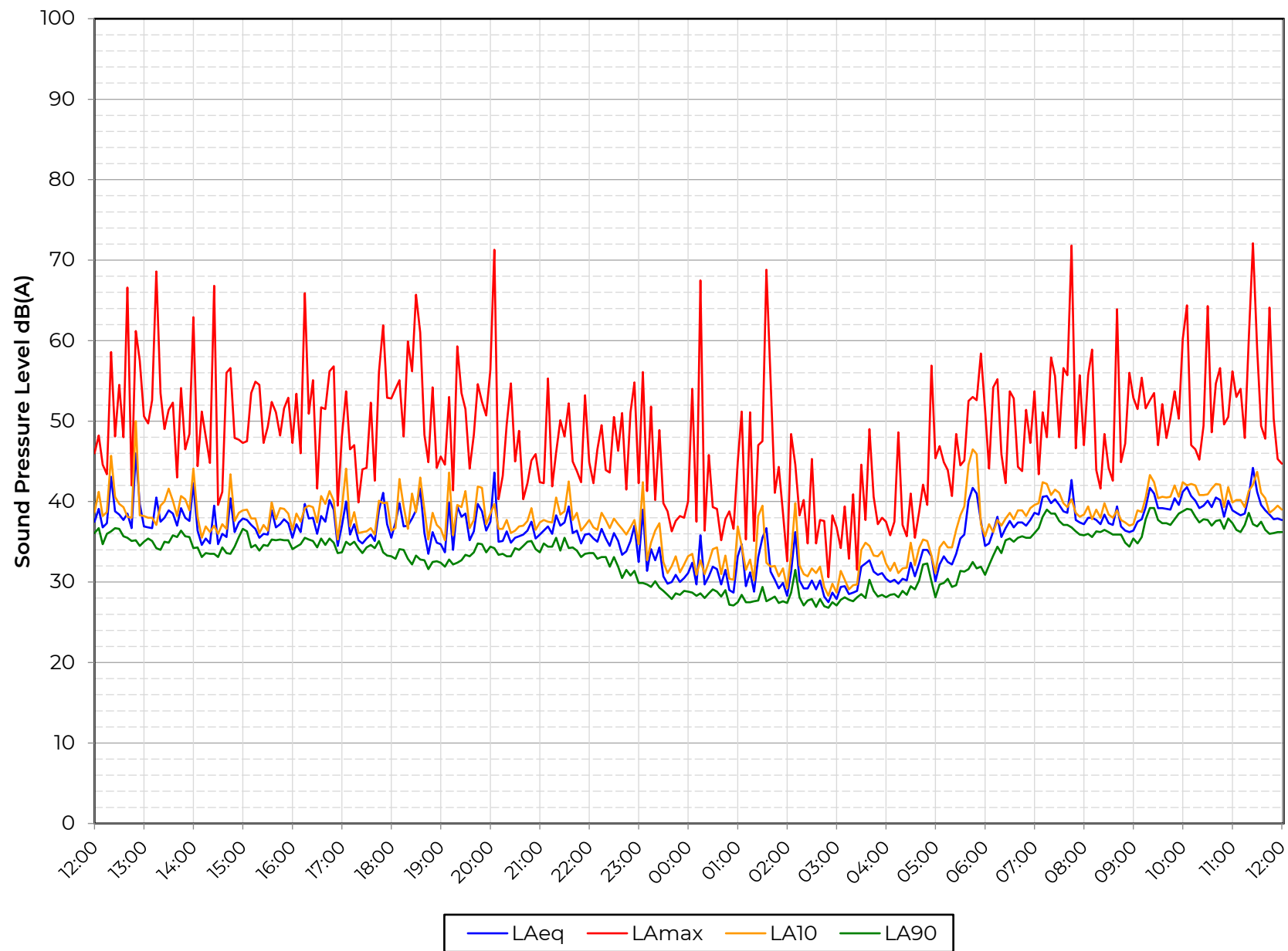
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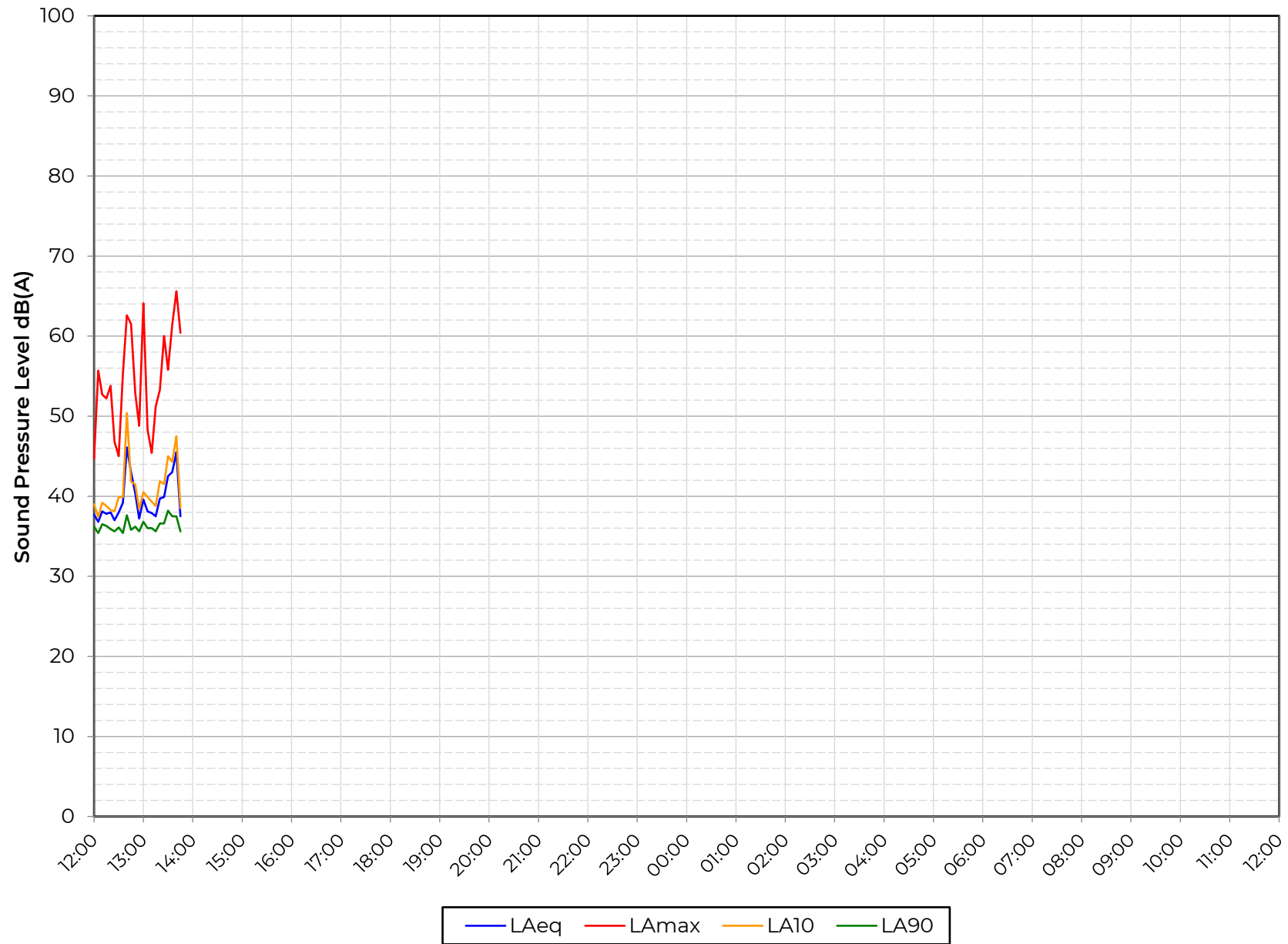
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Figure AS14019/TH12

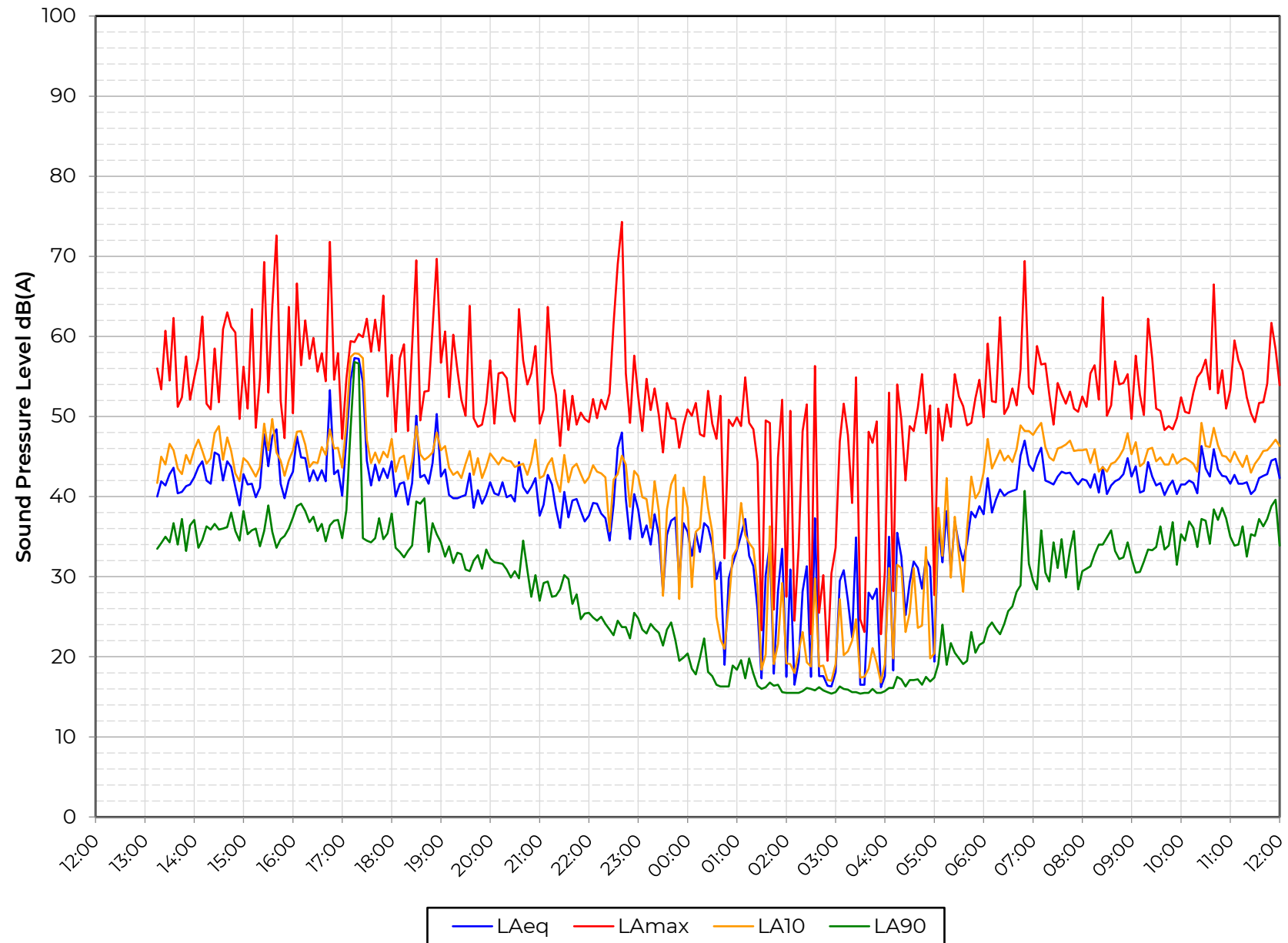
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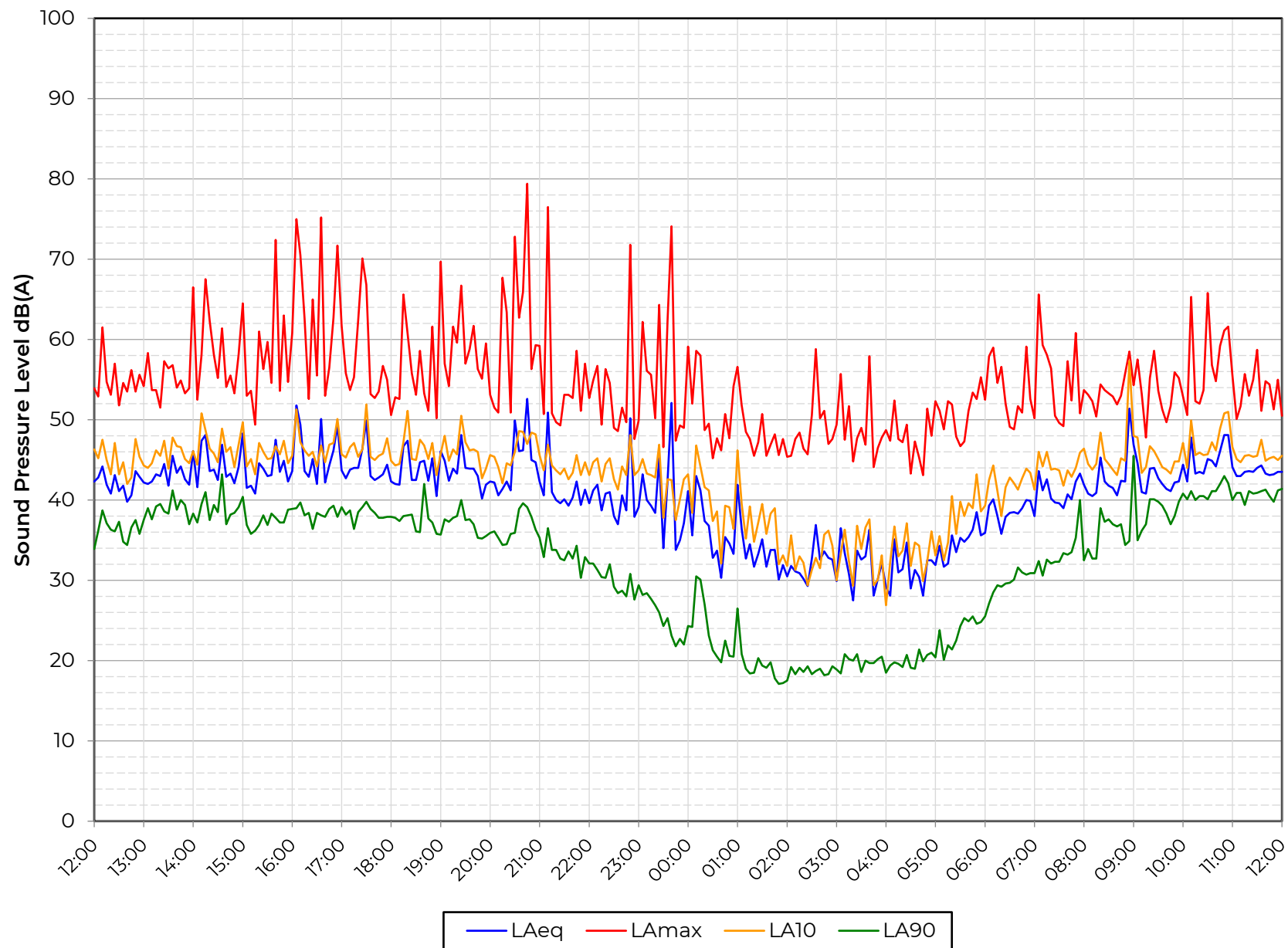
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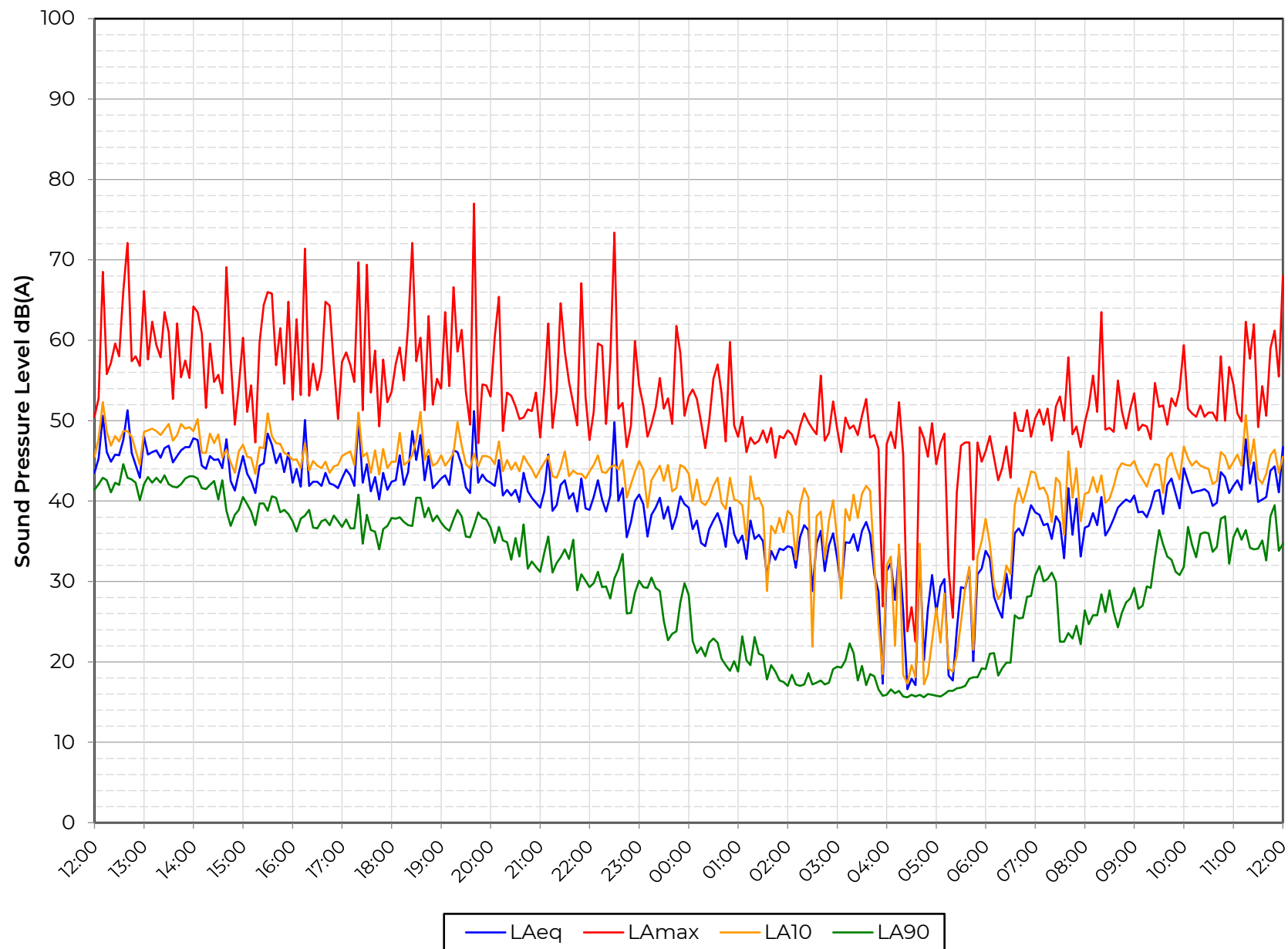
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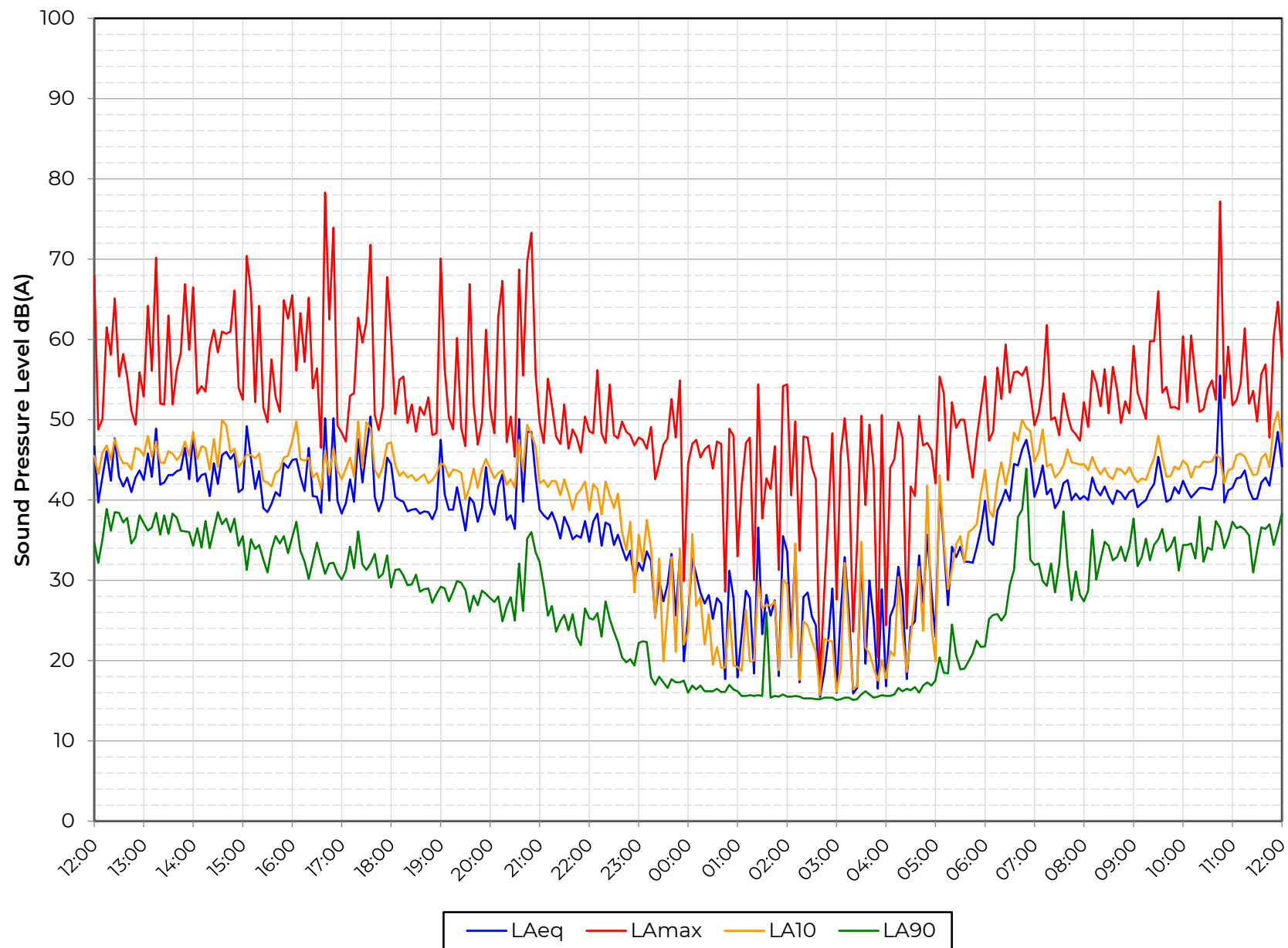
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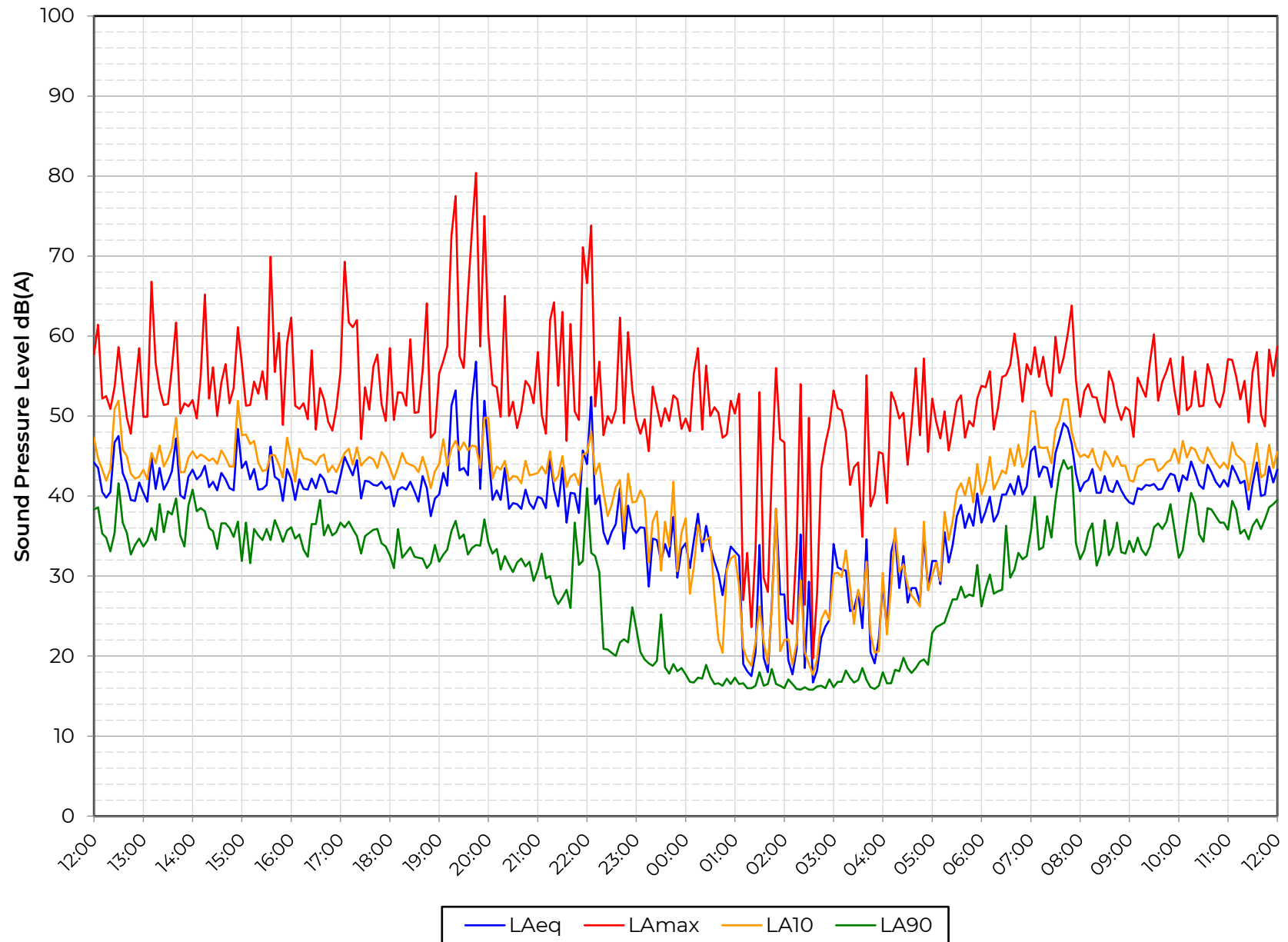
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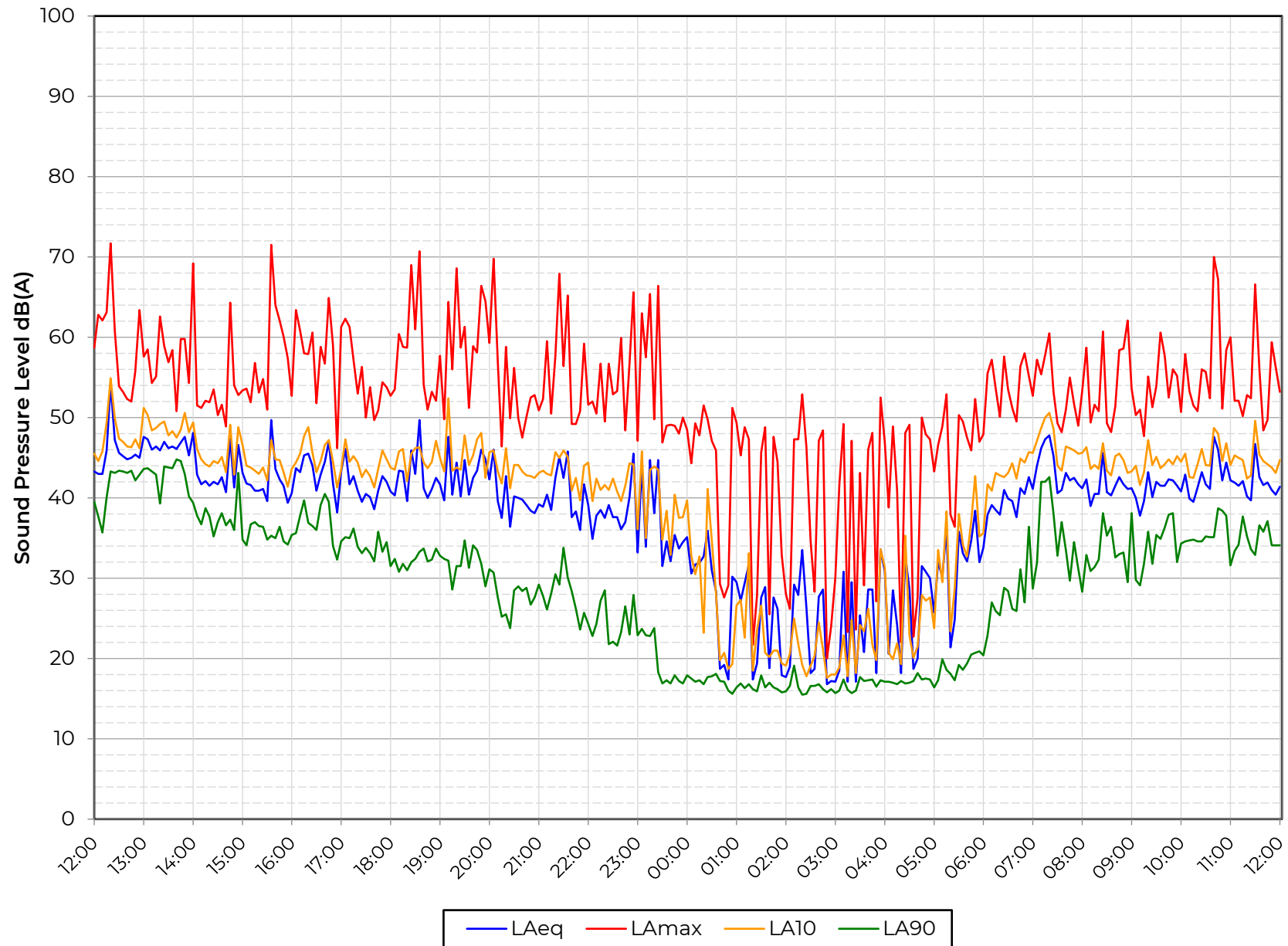
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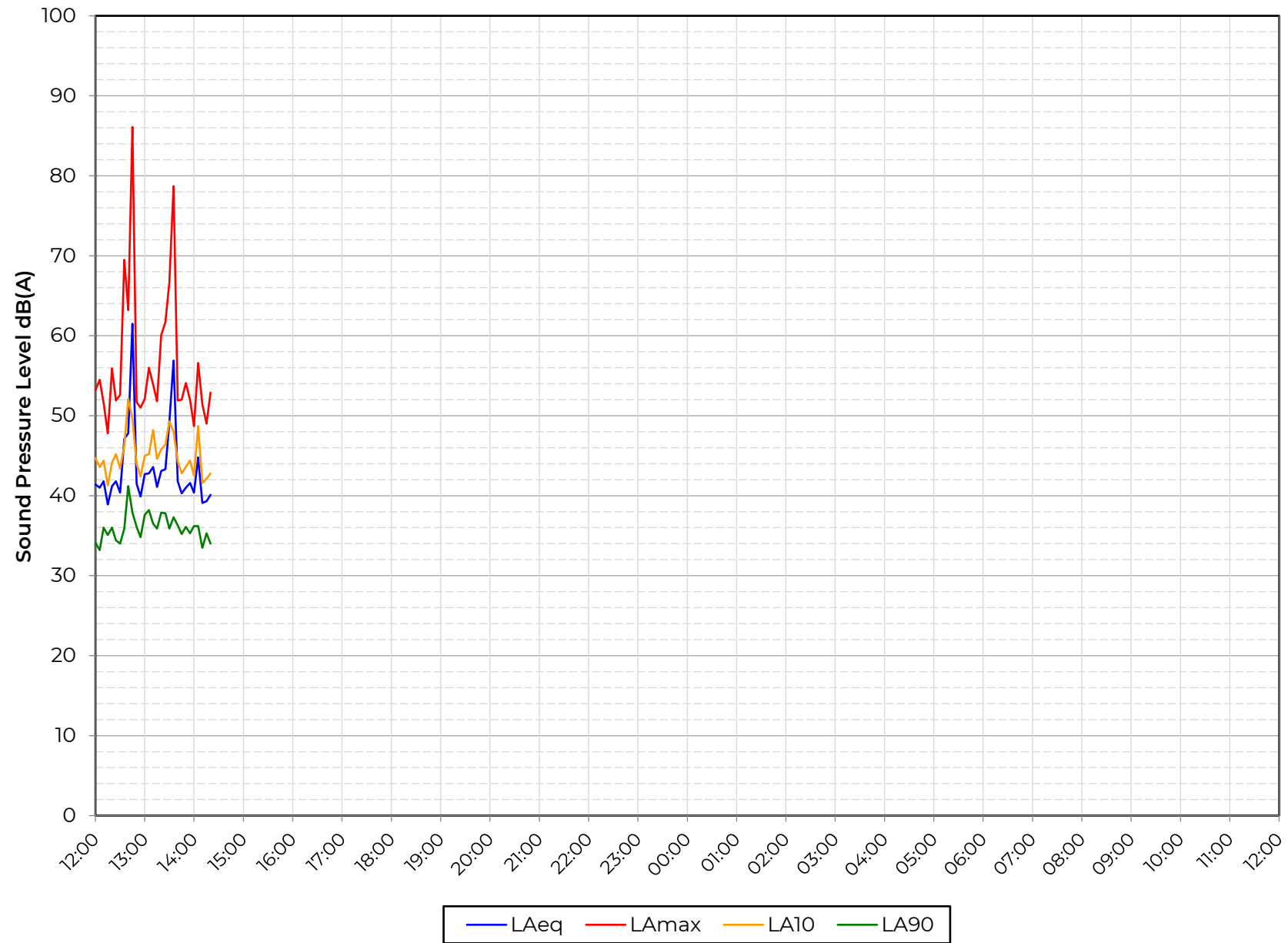
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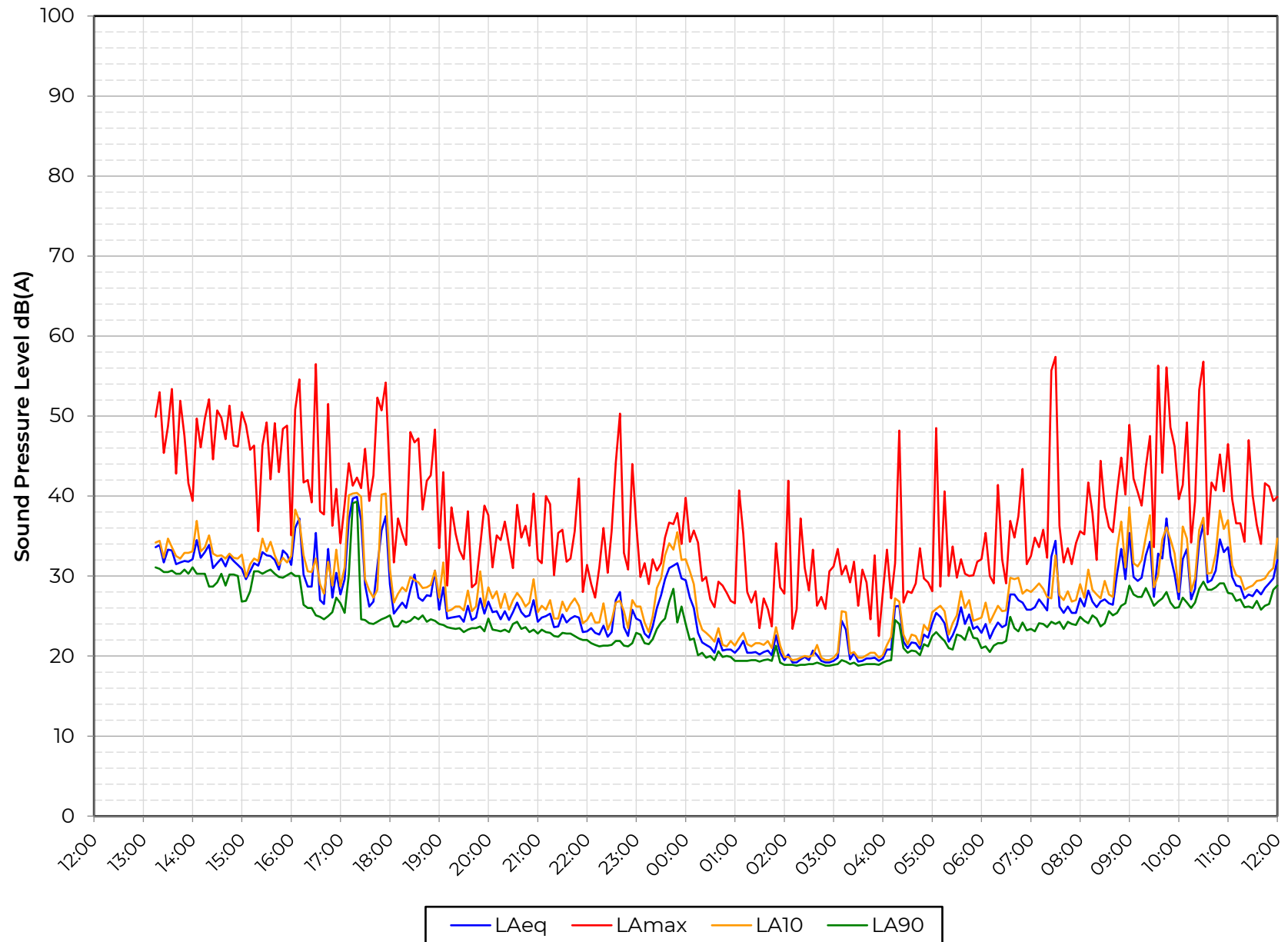
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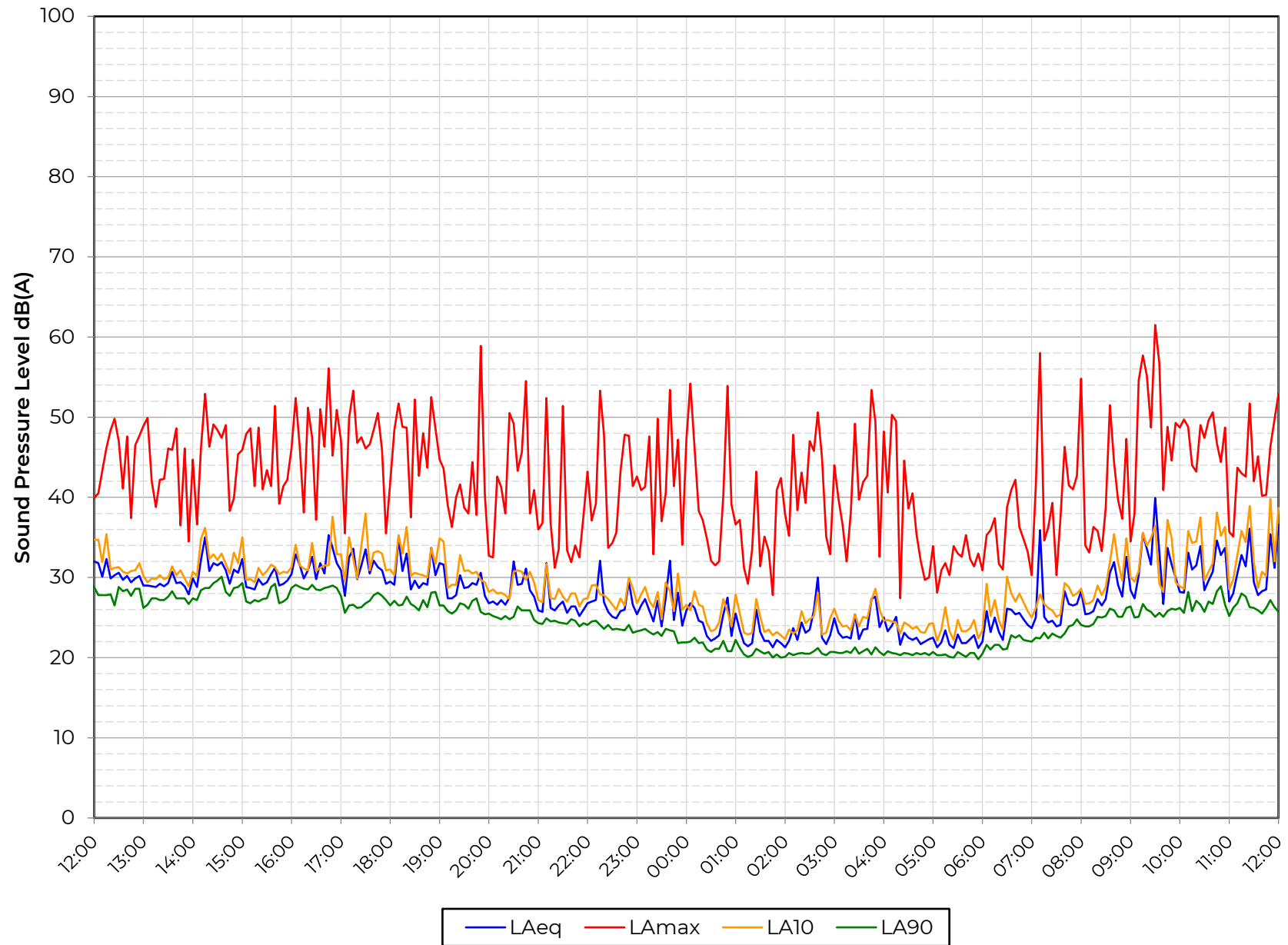
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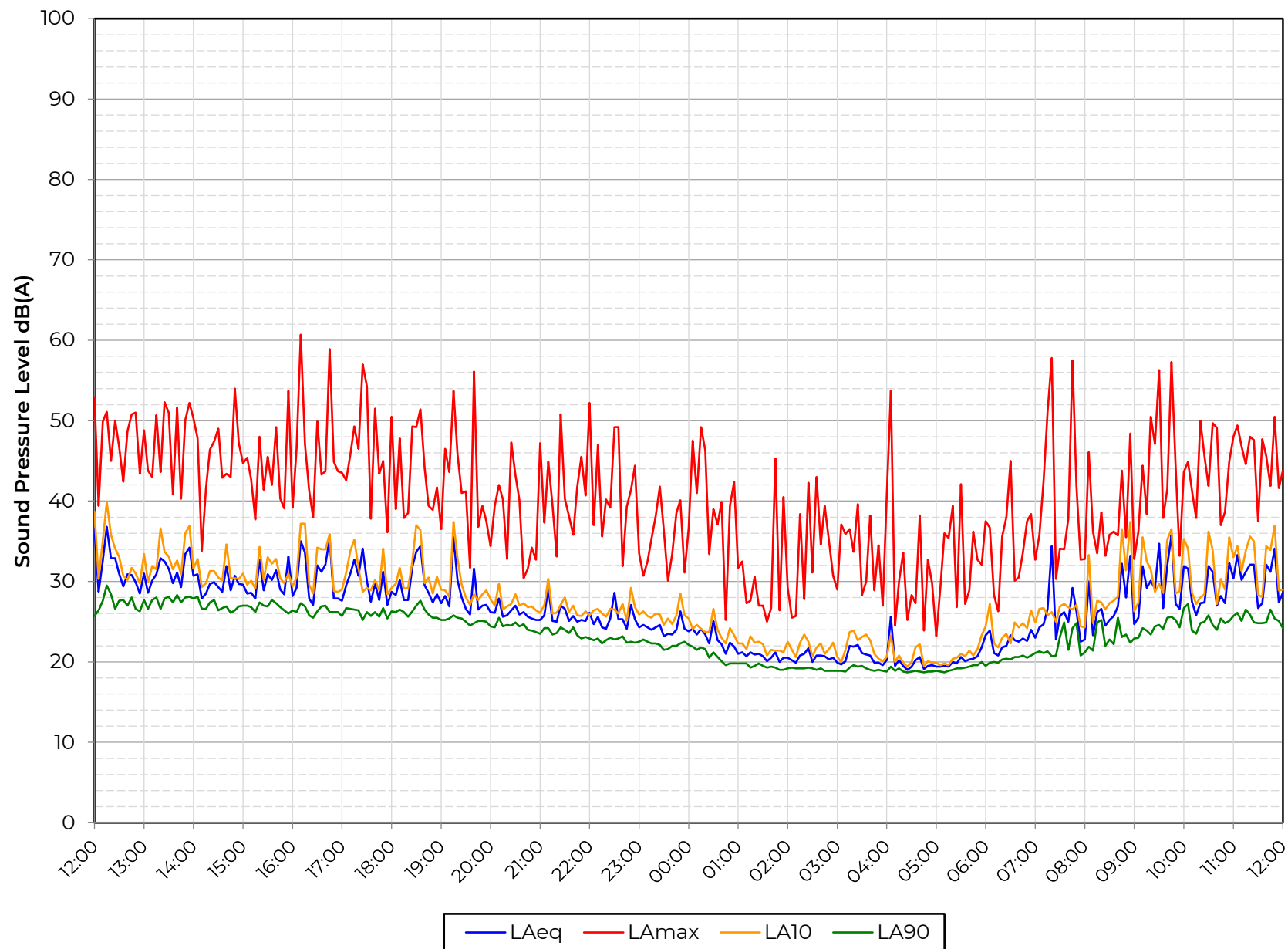
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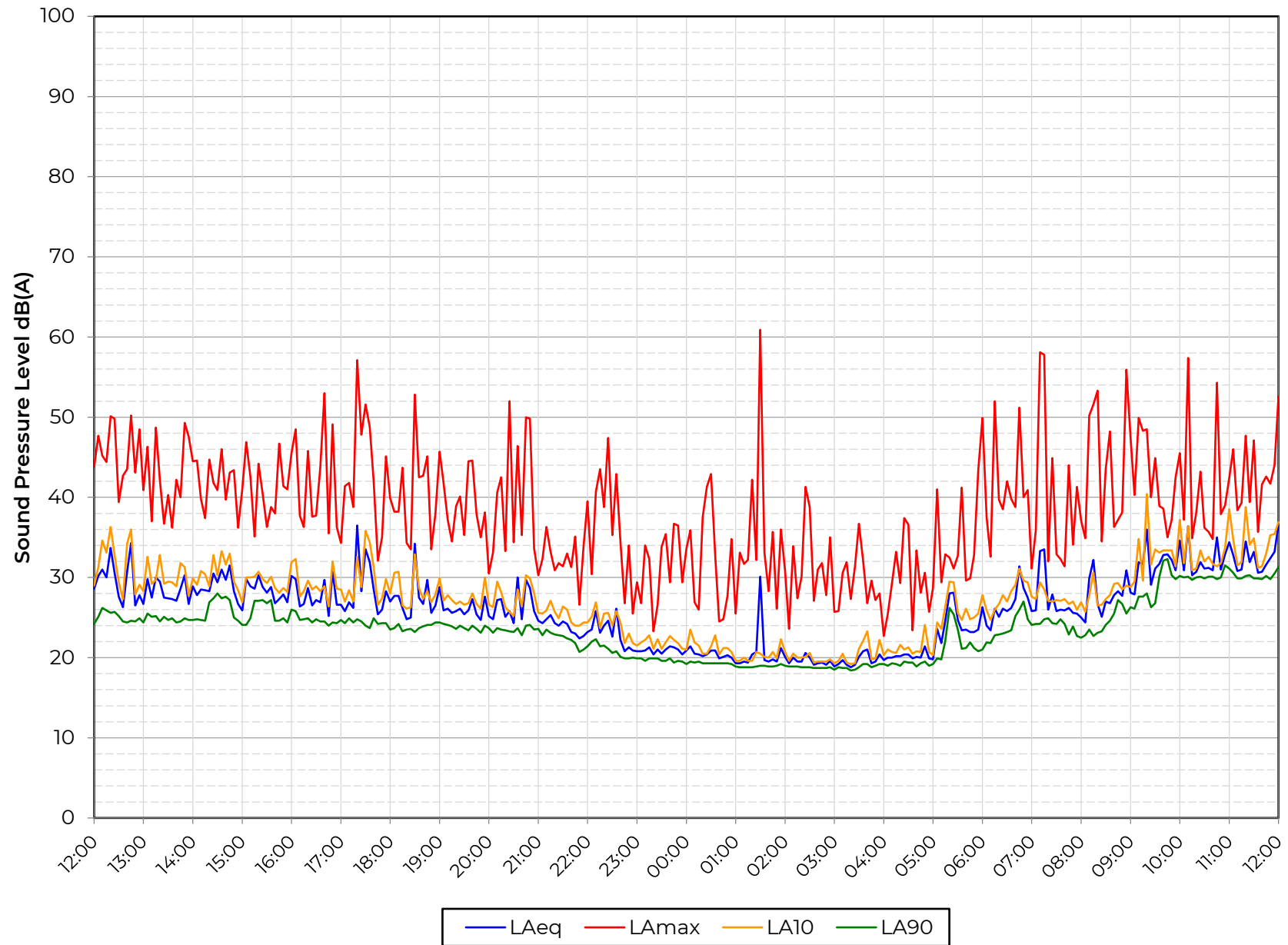
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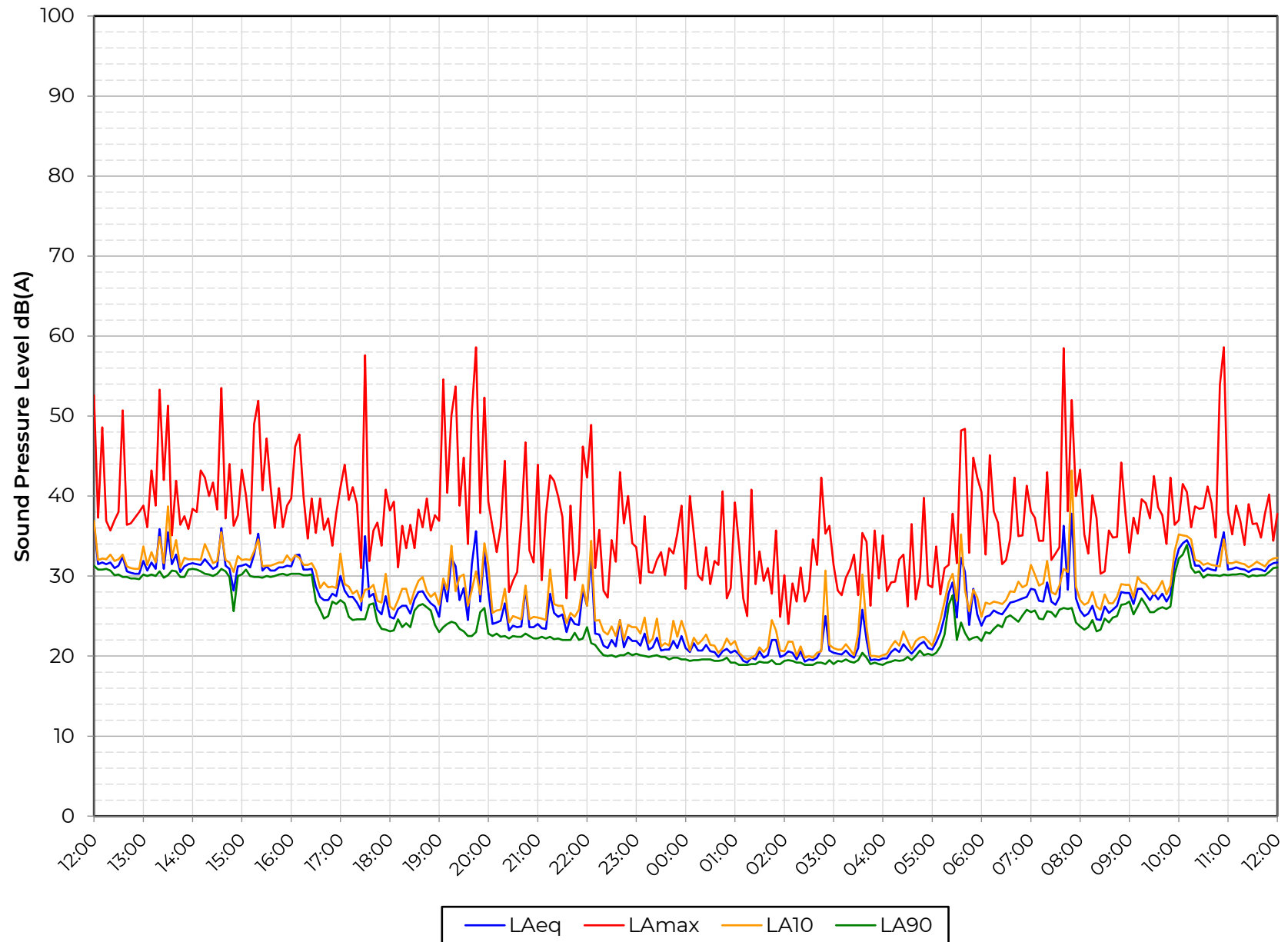
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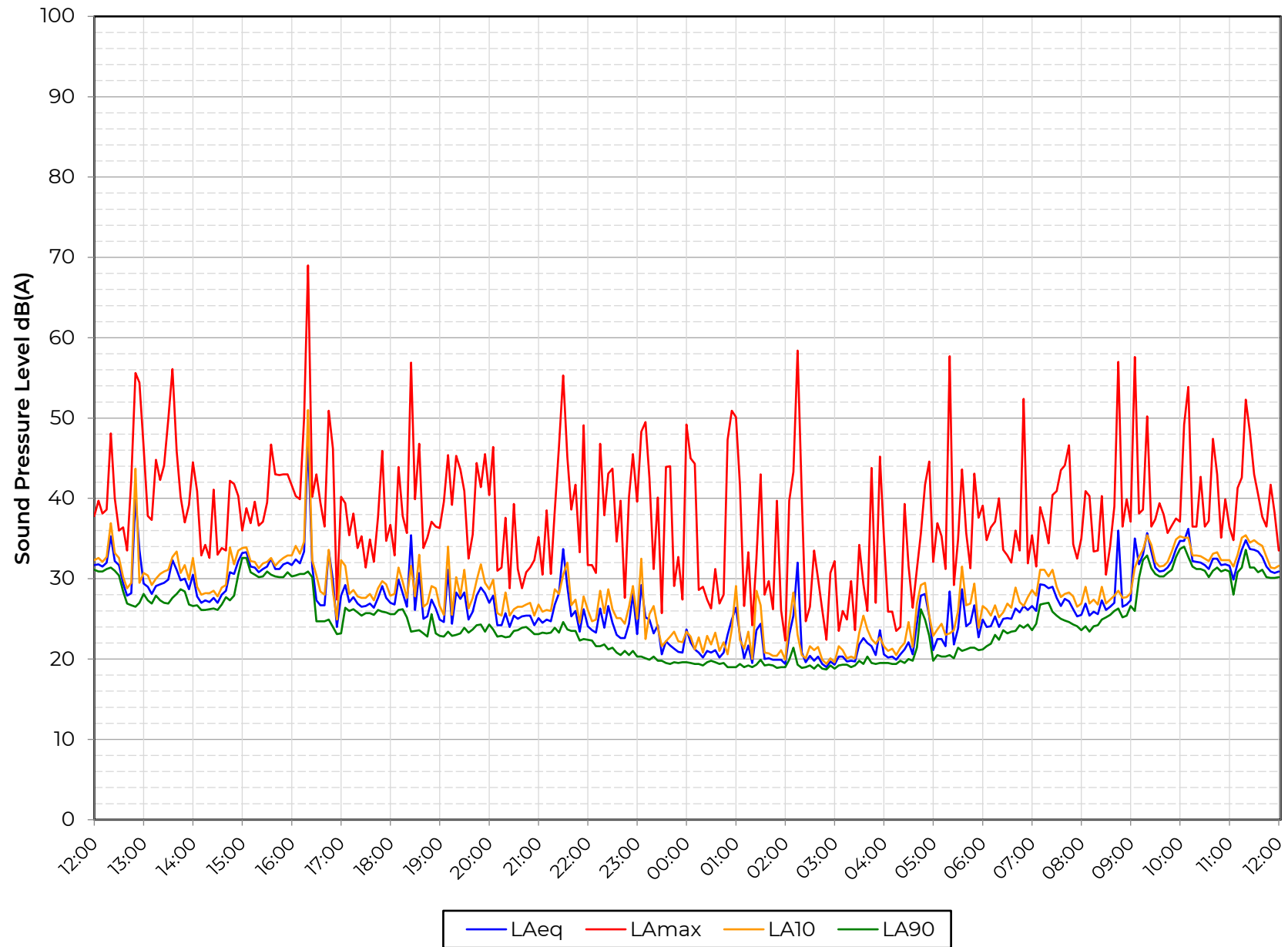
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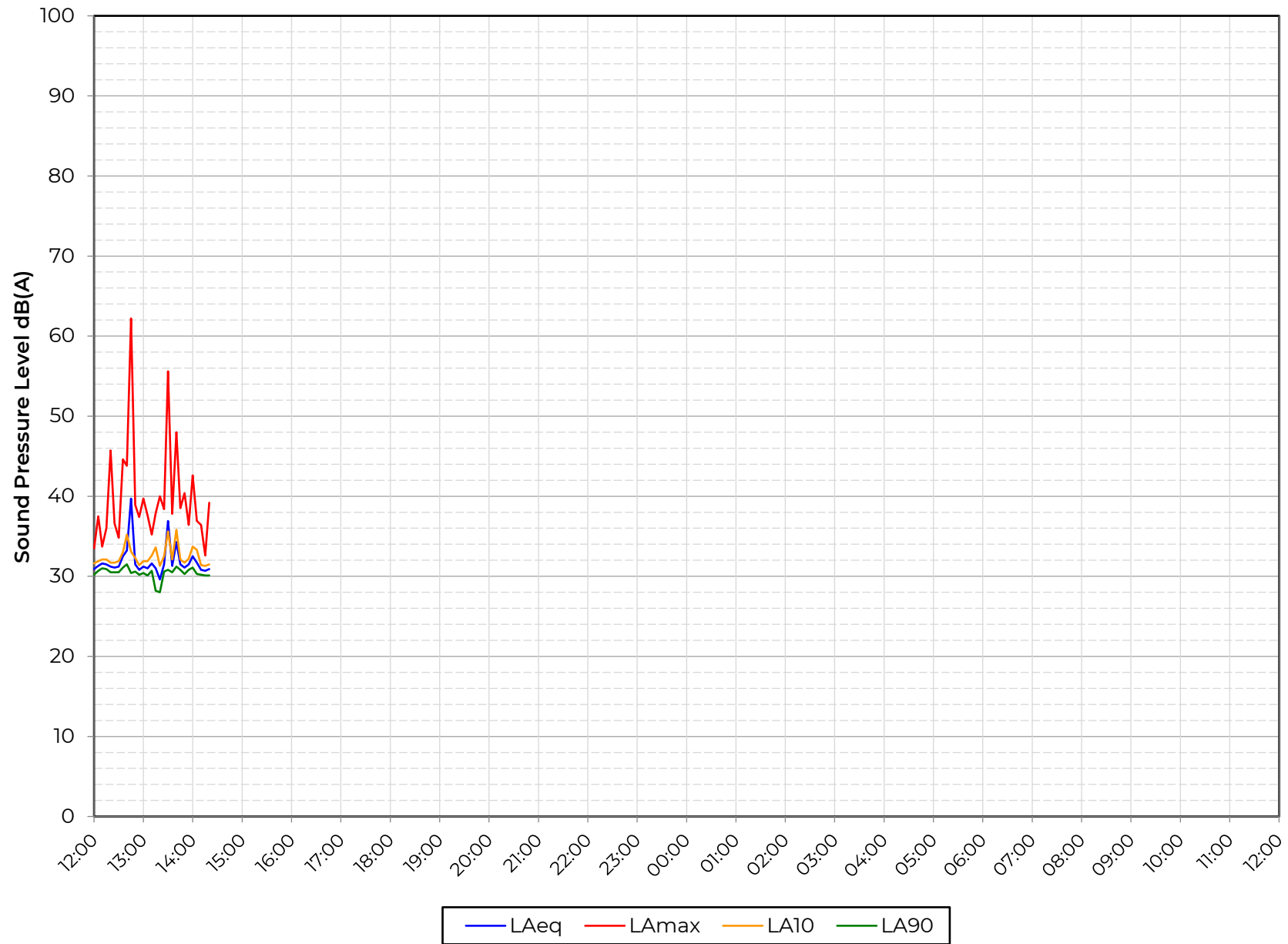
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Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

Sound	Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.
Noise	Sound that is unwanted by or disturbing to the perceiver.
Frequency	The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'.
dB(A):	Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or L_A .
L_{eq}:	A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc). The concept of L_{eq} (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction. Because L_{eq} is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit.
L_{10} & L_{90}:	Statistical L_n indices are used to describe the level and the degree of fluctuation of non-steady sound. The term refers to the level exceeded for n% of the time. Hence, L_{10} is the level exceeded for 10% of the time and as such can be regarded as a typical maximum level. Similarly, L_{90} is the typical minimum level and is often used to describe background noise. It is common practice to use the L_{10} index to describe noise from traffic as, being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic flow.
L_{max}:	The maximum sound pressure level recorded over a given period. L_{max} is sometimes used in assessing environmental noise, where occasional loud events occur which might not be adequately represented by a time-averaged L_{eq} value.
R	<i>Sound Reduction Index</i> . Effectively the Level Difference of a building element when measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010 and corrected for its size and the reverberant characteristics of the receive room.
D	The sound insulation performance of a construction is described in terms of the difference in sound level on either side of the construction in the presence of a sound source on one side and the reverberant characteristics of the adjoining 'receive' space. D is the arithmetic Level Difference in decibels between the source and receive sound levels when filtered into frequency bands.

- $D_{n,e}$

Normalised sound insulation of small building elements of fixed dimensions, such as vents, measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010.
- $R_w D_{n,e,w}$

Value of parameter, determined as above, but weighted in accordance with the procedures laid down in BS EN ISO 717-1 to provide a single-figure value.

Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band.

In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

Octave Band Centre Frequency Hz	63	125	250	500	1000	2000	4000	8000
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Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

INTERPRETATION

Change in Sound Level dB	Subjective Impression	Human Response
0 to 2	Imperceptible change in loudness	Marginal
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial

Earth Bunds and Barriers - Effective Screen Height

When considering the reduction in sound level of a source provided by a barrier, it is necessary to establish the "effective screen height". For example if a tall barrier exists between a sound source and a listener, with the barrier close to the listener, the listener will perceive the sound as being louder if he climbs up a ladder (and is closer to the top of the barrier) than if he were standing at ground level. Equally if he sat on the ground the sound would seem quieter than if he were standing. This is explained by the fact that the "effective screen height" is changing with the three cases above. In general, the greater the effective screen height, the greater the perceived reduction in sound level.

Similarly, the attenuation provided by a barrier will be greater where it is aligned close to either the source or the listener than where the barrier is midway between the two.