

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

University of
Salford
MANCHESTER

Page 1 of 16

APPROVED SIGNATORIES

Claire Lomax [x] Andy Moorhouse []

Gary Phillips [] Danny McCaul []



acoustic test & calibration laboratory

The University of Salford, Salford, Greater Manchester, M5 4WT, UK

<http://www.acoustics.salford.ac.uk>

t 0161 295 3030/0161 295 3319 f 0161 295 4456 e c.lomax1@salford.ac.uk

Determination of airborne noise from an appliance

Measurements described in this test report comply with:-
BS EN ISO 3744:2010 'Acoustics. Determination of sound power levels and sound energy levels of noise sources using sound pressure.
Engineering methods for an essentially free field over a reflecting plane'

COMPANY NAME & ADDRESS:

Chauvet UK
POD 1
EVO Park
Nottingham
NG16 6NT

FOR ATTENTION OF:

Ben Virgo

UNIT UNDER TEST:

Lighting unit, Storm 2 Profile

DATE OF TEST:

5th March 2024

TEST ENGINEER:

Sean Furlong

MEASUREMENT PURPOSE:

To determine airborne noise by measurements to the above standards.

Results relate only to samples tested. Items tested are the samples supplied by the manufacturer, who was responsible for selecting at random from a standard production run.

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 2 of 16

1.0 Description of Appliance Under Test

| | |
|--|--|
| CATEGORY: | Lighting Unit |
| DESIGN CHARACTERISTICS: | Floor mounted |
| MANUFACTURER: | Chauvet |
| MODEL: | Storm 2 Profile |
| TEST REF NUMBERS: | 06681/03_1 to 7 |
| SERIAL NUMBER: | Not Stated |
| POWER: | Not Stated |
| POWER SOURCE: | UK Mains |
| SETTINGS: <i>*See Table 1.0 below for explanation of settings</i> | 06681/03_1 "Ambient" 06681/03_2 "Max" 06681/03_3 "Eco" 06681/03_4 "Auto" 06681/03_5 "Full" 06681/03_6 "TV25" 06681/03_7 "TV35" |

* Table 1.0 – Explanation of the “Settings” used to create the Test Configuration of the sample for each measurement.

Explanation of Settings Used for Each Test

| Setting Name | Test Configuration |
|--------------|---|
| Ambient | Unit is in idle state, switched on and no output or movements |
| Max | Unit is using all mechanical options and the light output is on |
| Eco | All Effects Static, 100% Light output — ECO Fan mode |
| Auto | All Effects Static, 100% Light output — Auto Fan mode |
| Full | All Effects Static, 100% Light output — Full Fan mode |
| TV25 | All Effects Static, 100% Light output — TV25 Fan mode |
| TV35 | All Effects Static, 100% Light output — TV35 Fan mode |

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 3 of 16

2.0 Test Conditions

2.1 The following conditions were measured over duration of the test:-

| | Measured Average Value |
|---------------------------------|------------------------|
| TEST REF NUMBER: | 06681/03_1 to 7 |
| SERIAL NO. / SAMPLE REF. | Storm 2 Profile |
| Atmospheric Pressure | 100.600 |
| Ambient Temperature | 22.32 |
| Ambient Relative Humidity | 34.07 |

2.2 The test was carried out in the hemi-anechoic chamber at the University of Salford.

2.3 The unit under test was mounted directly on the floor, in the centre of the hemi-anechoic chamber.

2.4 Unit operation was controlled by the client from outside the chamber, after initial configuration directly at the unit. Measurements were taken immediately after each setting of the unit was set and confirmed by the client.

2.5 For measurement of the sound pressure level of the Reference Sound Source (RSS), the RSS was placed directly on the floor of the hemi-anechoic chamber at the same location as the unit under test as defined in BS EN ISO 3744: 2010.

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 4 of 16

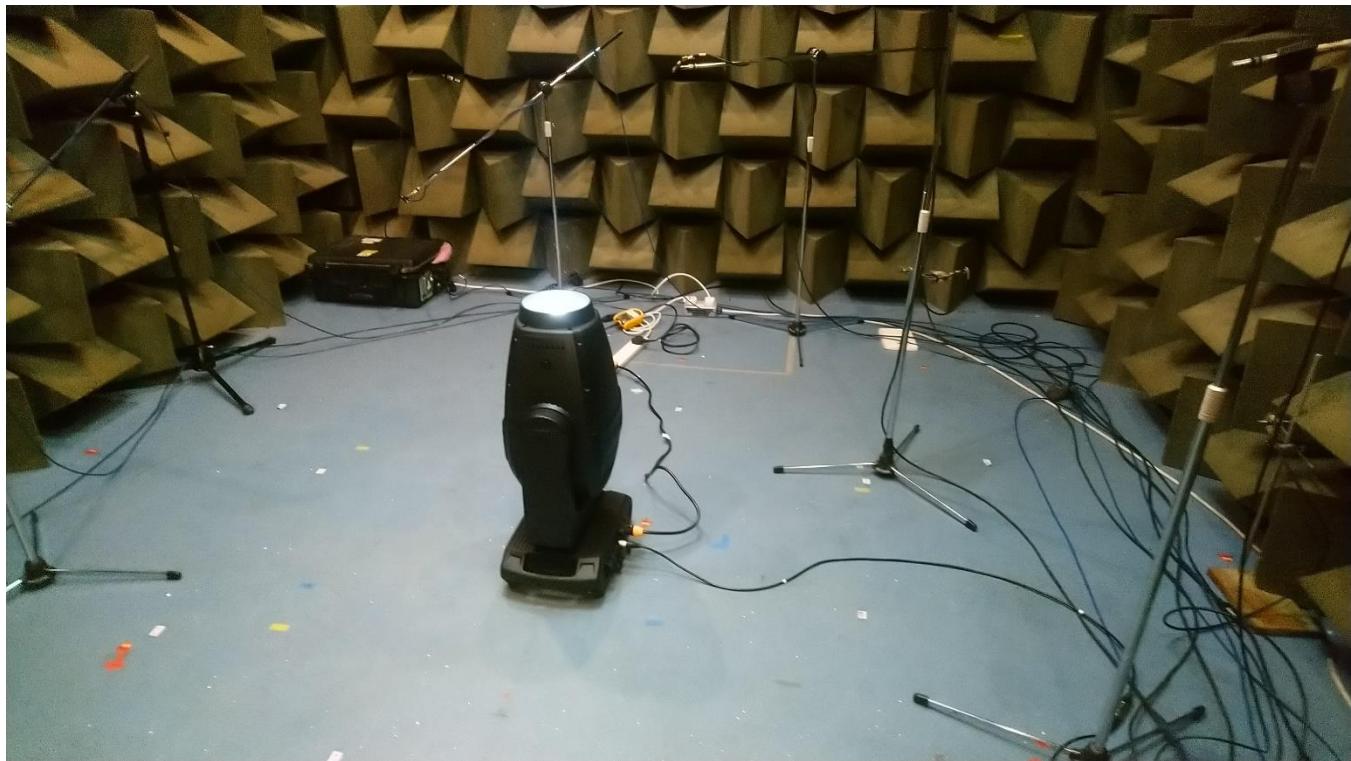


Figure 1 – unit under test mounted in the hemi-anechoic chamber at the University of Salford.

3 Acoustical Data

3.1 Measurement method

A direct measurement method was used as stated in BS EN ISO 3744: 2010.

3.2 Reference Sound Source

The Laboratory reference sound source (RSS) type B&K 4204, serial number 1460189 was used on mains supply.

3.3 Microphone Array

Ten laboratory free field, low noise microphones were used for the measurement, placed in fixed positions 1 to 10 on a hemispherical surface ($d = 1.75$ m) with guidance from BS EN ISO 3744: 2010. The location of each measurement position is provided in Appendix 1 to this report.

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 5 of 16

3.4 Measured sound pressure levels of the appliance

Each unit was run at the selected setting. Six measurements were made at each setting,

Mean sound pressure levels were measured over 30 seconds to give the measured sound pressure levels, L_{pi} at each measurement position in each third octave band. The sound power level was then calculated.

The background noise corrections K_1 , environmental correction calculated from RSS levels K_2 , measured sound pressure levels, L_{pi} at each measurement point, corrected sound pressure levels, L_{pf} , and the sound power level, L_w of the source in each third octave frequency band are given in Appendix 2 of this report. The measured time averaged sound pressure level of the RSS, $L'_{P(RSS)}$, at each microphone position is reported in Appendix 3 to this report.

3.5 Calculated sound power levels

The calculated A-Weighted sound power level, L_{WA} in dBA for each setting are given in table 3.1.

Table 3.1 –A-weighted noise emissions for each setting, averaged over 30 seconds and over 10 microphone positions.

| Test Number | 06681/3_1 | 06681/3_2 | 06681/3_3 | 06681/3_4 | 06681/3_5 | 06681/3_6 | 06681/3_7 |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Setting | Ambient | Max | Eco | Auto | Full | TV25 | TV35 |
| A-weighted sound power level, L_{WA} in dBA | 47.8 | 55.8 | 54.7 | 55.3 | 64.5 | 60.6 | 54.6 |

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 6 of 16

3.6 Sound Pressure Level at 1 m from the source (not covered by BS EN 3744: 2010)

The A-weighted Sound Power Level can be used to calculate the A-weighted sound pressure level expected at different distances from the source in hemi-anechoic free field conditions*.

The calculation of the sound pressure levels is based on the formulae in BS EN 3744: 2010 for a parallelepiped measurement surface (for a noise source measured, in this case, above a single reflective plane).

The calculations show that to estimate the average sound pressure level expected at a distance of 1 m from the surface of the unit, 13.4 dB should be subtracted from the sound power value. This would give A-weighted average sound pressure levels in table 3.2 for each unit setting at 1 m from the surface of the unit:-

Table 3.2 – Calculated A-weighted sound pressure level* for each setting at 1 m from the unit surface

| Test Number | 06681/3_1 | 06681/3_2 | 06681/3_3 | 06681/3_4 | 06681/3_5 | 06681/3_6 | 06681/3_7 |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Setting | Ambient | Max | Eco | Auto | Full | TV25 | TV35 |
| A-weighted sound pressure level, L_p in dBA | 34.4 | 42.4 | 41.3 | 41.9 | 51.1 | 47.2 | 41.2 |

*This calculation represents an estimate of the levels that would be obtained in hemi-anechoic free field conditions and should not be assumed to be valid for any specific building environments where the characteristics of the room should be accounted for.

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 7 of 16

Appendix 1 – Locations of measurement positions

Defining measurement surface & Co-ordinates

Measurement distance, d

1.75 m

| | x, mm | y, mm | z, mm |
|------------------------|---------|---------|--------|
| Microphone Position 1 | 280 | -1680 | 385 |
| Microphone Position 2 | 1365 | -1050 | 350 |
| Microphone Position 3 | 1365 | 962.5 | 542.5 |
| Microphone Position 4 | 280 | 1575 | 717.5 |
| Microphone Position 5 | -1452.5 | 560 | 787.5 |
| Microphone Position 6 | -1452.5 | -700 | 665 |
| Microphone Position 7 | -455 | -1137.5 | 1242.5 |
| Microphone Position 8 | 1295 | -122.5 | 1172.5 |
| Microphone Position 9 | -455 | 875 | 1452.5 |
| Microphone Position 10 | 175 | -175 | 1732.5 |

Surface Area, m²

19.24 m²

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 8 of 16

Appendix 2 – Measurements and calculations according to BS EN ISO 3744

The following tables include measurement details that provide in each third octave band, for each of the seven settings:-

- measured L_{pi} , averaged over 30 s, at each measurement position
- background noise corrections K_1
- environmental correction K_2 , calculated from RSS levels
- corrected sound pressure levels, L_{pf}
- the sound power level, L_w of the source
- the A-weighted sound power level, L_{wA} of the source

! The levels at these frequencies are affected by background level and therefore levels quoted represent an upper limit for the sound pressure levels of the noise source.

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 9 of 16

| MEASURED TIME AVERAGED SPL at 1 m, L_p - [06681/3_1 – Ambient Setting] | | | | | | | | | | | Mean L_p over mic positions | ΔL_p [dB] | BG corr. K_1 , [dB] | Env corr. K_2 , [dB] | L_p [dB] | Sound Power, L_w [dB] | A-weighting corrections [dB] | Sound Power, L_{wA} [dB] |
|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------------------------|-------------------|-----------------------|------------------------|------------|-------------------------|------------------------------|----------------------------|
| Frequency [Hz] | Mic 1 [dB] | Mic 2 [dB] | Mic 3 [dB] | Mic 4 [dB] | Mic 5 [dB] | Mic 6 [dB] | Mic 7 [dB] | Mic 8 [dB] | Mic 9 [dB] | Mic 10 [dB] | | | | | | | | |
| 100 | 19.1 | 18.2 | 14.9 | 14.9 | 16.3 | 16.2 | 12.7 | 15.5 | 11.4 | 11.9 | 15.8 | 3.0 | 1.30 | -2.4 | 16.8 | 29.7 | -19.1 | 10.6 |
| 125 | 19.0 | 15.4 | 16.8 | 20.0 | 11.1 | 13.9 | 17.4 | 11.3 | 14.8 | 8.7 | 16.1 | 9.3 | 0.55 | 1.2 | 14.4 | 27.2 | -16.1 | 11.1 |
| 160 | 14.7 | 12.7 | 12.2 | 13.5 | 12.5 | 12.7 | 10.9 | 9.8 | 9.8 | 6.5 | 12.0 | 9.1 | 0.57 | 0.6 | 10.9 | 23.7 | -13.4 | 10.3 |
| 200 | 16.9 | 18.2 | 16.9 | 14.7 | 17.6 | 17.3 | 13.0 | 15.1 | 11.6 | 8.1 | 15.8 | 20.1 | 0.00 | 1.3 | 14.4 | 27.3 | -10.9 | 16.4 |
| 250 | 20.8 | 23.9 | 22.4 | 18.6 | 20.3 | 20.2 | 18.3 | 18.9 | 16.7 | 14.2 | 20.2 | 25.9 | 0.00 | 1.4 | 18.7 | 31.6 | -8.6 | 23.0 |
| 315 | 21.4 | 24.4 | 22.2 | 19.6 | 21.9 | 22.1 | 17.8 | 19.8 | 15.4 | 16.4 | 20.9 | 28.7 | 0.00 | -0.5 | 21.4 | 34.2 | -6.6 | 27.6 |
| 400 | 18.3 | 17.9 | 17.6 | 16.5 | 14.9 | 16.2 | 12.5 | 12.0 | 12.3 | 13.5 | 15.8 | 24.0 | 0.00 | 0.6 | 15.1 | 28.0 | -4.8 | 23.2 |
| 500 | 22.3 | 22.8 | 20.4 | 16.2 | 18.0 | 19.2 | 18.3 | 14.7 | 18.1 | 22.4 | 20.0 | 28.5 | 0.00 | 0.2 | 19.8 | 32.6 | -3.2 | 29.4 |
| 630 | 23.8 | 25.4 | 20.9 | 21.4 | 20.2 | 23.7 | 24.8 | 23.8 | 22.1 | 27.2 | 23.8 | 32.9 | 0.00 | -0.3 | 24.1 | 36.9 | -1.9 | 35.0 |
| 800 | 24.1 | 25.3 | 21.8 | 22.5 | 22.5 | 21.7 | 22.1 | 26.9 | 23.5 | 22.6 | 23.6 | 32.5 | 0.00 | -0.4 | 24.1 | 36.9 | -0.8 | 36.1 |
| 1000 | 23.7 | 24.1 | 22.2 | 21.5 | 23.6 | 23.6 | 22.5 | 27.5 | 22.5 | 22.4 | 23.7 | 31.9 | 0.00 | -0.9 | 24.6 | 37.5 | 0 | 37.5 |
| 1250 | 25.6 | 24.8 | 25.9 | 26.1 | 26.7 | 28.1 | 26.4 | 27.8 | 23.5 | 24.7 | 26.2 | 33.7 | 0.00 | -0.7 | 26.9 | 39.7 | 0.6 | 40.3 |
| 1600 | 31.4 | 24.3 | 28.1 | 29.6 | 25.8 | 28.3 | 26.4 | 30.4 | 33.7 | 27.3 | 29.4 | 36.3 | 0.00 | -0.2 | 29.6 | 42.5 | 1 | 43.5 |
| 2000 | 29.2 | 23.7 | 25.5 | 26.4 | 24.4 | 22.5 | 26.7 | 23.8 | 27.0 | 23.5 | 25.7 | 32.0 | 0.00 | 0.3 | 25.4 | 38.2 | 1.2 | 39.4 |
| 2500 | 21.0 | 18.9 | 18.8 | 18.8 | 16.9 | 16.7 | 19.6 | 19.9 | 19.8 | 17.8 | 19.0 | 24.5 | 0.00 | -0.3 | 19.3 | 32.1 | 1.3 | 33.4 |
| 3150 | 16.0 | 17.7 | 17.7 | 17.2 | 14.9 | 14.3 | 16.5 | 15.5 | 16.7 | 16.6 | 16.4 | 21.3 | 0.00 | 0.1 | 16.3 | 29.2 | 1.2 | 30.4 |
| 4000 | 11.1 | 14.5 | 12.8 | 12.7 | 12.4 | 12.1 | 11.8 | 11.7 | 13.2 | 11.7 | 12.5 | 16.8 | 0.00 | 0.4 | 12.1 | 24.9 | 1 | 25.9 |
| 5000 | 9.3 | 8.7 | 10.8 | 9.0 | 8.6 | 8.9 | 9.1 | 8.1 | 10.0 | 6.9 | 9.1 | 13.0 | 0.22 | -0.8 | 9.6 | 22.5 | 0.5 | 23.0 |
| 6300 | 8.3 | 8.7 | 8.0 | 7.8 | 5.4 | 7.4 | 6.1 | 6.7 | 6.9 | 4.6 | 7.2 | 11.3 | 0.33 | -0.5 | 7.3 | 20.1 | -0.1 | 20.0 |
| 8000 | 4.0 | 3.1 | 4.2 | 2.9 | 2.2 | 2.6 | 3.0 | 2.1 | 4.4 | -0.1 | 3.0 | 6.8 | 1.03 | -0.2 | 2.2 | 15.0 | -1.1 | 13.9 |
| 10000 | -0.2 | 0.3 | 1.8 | 0.5 | 0.5 | 0.5 | -0.2 | 0.2 | 1.5 | -1.8 | 0.4 | 3.2 | 1.30 | 0.1 | -1.0 | 11.8 | -2.5 | 9.3 |

A-WEIGHTED SOUND POWER LEVEL 47.8

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

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 10 of 16

| MEASURED TIME AVERAGED SPL at 1 m, L_p - [06681/3_2 - Max Setting] | | | | | | | | | | | | Mean L_p over mic positions | ΔL_p [dB] | BG corr. K_1 , [dB] | Env corr. K_2 , [dB] | L_p [dB] | Sound Power, L_w [dB] | A-weighting corrections [dB] | Sound Power, L_{wA} [dB] |
|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|------|-------------------------------|-------------------|-----------------------|------------------------|------------------------------|-------------------------|------------------------------|----------------------------|
| Frequency [Hz] | Mic 1 [dB] | Mic 2 [dB] | Mic 3 [dB] | Mic 4 [dB] | Mic 5 [dB] | Mic 6 [dB] | Mic 7 [dB] | Mic 8 [dB] | Mic 9 [dB] | Mic 10 [dB] | | | | | | | | | |
| 100 | 18.4 | 16.6 | 16.1 | 16.5 | 16.2 | 16.0 | 14.7 | 17.4 | 14.9 | 16.4 | 16.4 | 3.7 | 1.30 | -2.4 | 17.5 | 30.3 | -19.1 | 11.2 | |
| 125 | 20.6 | 21.3 | 20.3 | 19.9 | 20.6 | 20.7 | 19.5 | 21.4 | 19.0 | 19.0 | 20.3 | 13.5 | 0.20 | 1.2 | 19.0 | 31.8 | -16.1 | 15.7 | |
| 160 | 21.3 | 20.3 | 20.0 | 19.8 | 21.3 | 21.4 | 18.0 | 19.4 | 17.3 | 18.5 | 19.9 | 17.0 | 0.00 | 0.6 | 19.4 | 32.2 | -13.4 | 18.8 | |
| 200 | 23.0 | 24.6 | 23.7 | 20.6 | 23.7 | 23.9 | 20.8 | 22.4 | 20.8 | 19.9 | 22.6 | 26.9 | 0.00 | 1.3 | 21.3 | 34.1 | -10.9 | 23.2 | |
| 250 | 25.2 | 27.5 | 26.0 | 22.7 | 24.0 | 24.2 | 23.6 | 23.3 | 23.0 | 23.6 | 24.6 | 30.3 | 0.00 | 1.4 | 23.1 | 36.0 | -8.6 | 27.4 | |
| 315 | 35.9 | 35.4 | 32.8 | 33.3 | 33.2 | 33.3 | 31.8 | 31.6 | 31.9 | 32.3 | 33.4 | 41.3 | 0.00 | -0.5 | 33.9 | 46.7 | -6.6 | 40.1 | |
| 400 | 29.4 | 29.1 | 28.4 | 27.3 | 26.9 | 27.3 | 26.5 | 26.5 | 25.9 | 27.9 | 27.7 | 35.9 | 0.00 | 0.6 | 27.1 | 39.9 | -4.8 | 35.1 | |
| 500 | 31.5 | 30.9 | 28.0 | 25.3 | 24.7 | 25.8 | 27.8 | 26.4 | 27.7 | 30.6 | 28.5 | 37.0 | 0.00 | 0.2 | 28.3 | 41.1 | -3.2 | 37.9 | |
| 630 | 33.0 | 34.4 | 30.0 | 29.3 | 30.8 | 29.8 | 34.5 | 33.4 | 32.9 | 35.3 | 32.8 | 41.9 | 0.00 | -0.3 | 33.1 | 45.9 | -1.9 | 44.0 | |
| 800 | 33.5 | 34.6 | 30.7 | 32.5 | 34.6 | 33.3 | 34.6 | 34.1 | 33.2 | 32.0 | 33.5 | 42.3 | 0.00 | -0.4 | 33.9 | 46.8 | -0.8 | 46.0 | |
| 1000 | 32.1 | 32.9 | 32.6 | 34.7 | 35.5 | 35.1 | 34.0 | 34.0 | 32.6 | 32.7 | 33.8 | 41.9 | 0.00 | -0.9 | 34.7 | 47.5 | 0 | 47.5 | |
| 1250 | 34.2 | 32.4 | 34.6 | 36.6 | 35.9 | 36.4 | 33.7 | 34.3 | 33.3 | 33.5 | 34.7 | 42.2 | 0.00 | -0.7 | 35.4 | 48.3 | 0.6 | 48.9 | |
| 1600 | 36.6 | 35.1 | 34.9 | 34.9 | 35.6 | 35.2 | 35.8 | 35.5 | 35.5 | 36.0 | 35.5 | 42.5 | 0.00 | -0.2 | 35.8 | 48.6 | 1 | 49.6 | |
| 2000 | 33.5 | 31.8 | 32.0 | 31.4 | 31.4 | 31.4 | 32.2 | 32.4 | 31.6 | 29.8 | 31.8 | 38.1 | 0.00 | 0.3 | 31.5 | 44.3 | 1.2 | 45.5 | |
| 2500 | 28.9 | 27.7 | 27.8 | 26.1 | 28.1 | 27.8 | 27.7 | 28.3 | 26.8 | 24.7 | 27.5 | 33.1 | 0.00 | -0.3 | 27.9 | 40.7 | 1.3 | 42.0 | |
| 3150 | 24.7 | 26.1 | 24.8 | 24.8 | 25.6 | 25.5 | 24.6 | 24.8 | 24.0 | 22.1 | 24.8 | 29.7 | 0.00 | 0.1 | 24.7 | 37.5 | 1.2 | 38.7 | |
| 4000 | 21.1 | 24.5 | 23.4 | 22.2 | 23.5 | 23.6 | 22.6 | 22.5 | 22.2 | 19.7 | 22.7 | 27.0 | 0.00 | 0.4 | 22.3 | 35.1 | 1 | 36.1 | |
| 5000 | 21.4 | 20.2 | 21.4 | 20.5 | 21.2 | 21.6 | 21.3 | 21.7 | 21.4 | 18.5 | 21.0 | 25.0 | 0.00 | -0.8 | 21.8 | 34.6 | 0.5 | 35.1 | |
| 6300 | 17.4 | 18.2 | 17.1 | 16.0 | 17.0 | 17.3 | 16.1 | 16.7 | 16.0 | 12.5 | 16.6 | 20.8 | 0.00 | -0.5 | 17.1 | 29.9 | -0.1 | 29.8 | |
| 8000 | 13.8 | 13.8 | 12.5 | 11.8 | 13.2 | 13.9 | 12.4 | 12.9 | 13.2 | 7.7 | 12.8 | 16.5 | 0.00 | -0.2 | 13.0 | 25.8 | -1.1 | 24.7 | |
| 10000 | 17.4 | 16.8 | 17.6 | 16.8 | 17.8 | 17.7 | 16.2 | 15.7 | 16.1 | 7.2 | 16.5 | 19.3 | 0.00 | 0.1 | 16.4 | 29.2 | -2.5 | 26.7 | |
| | | | | | | | | | | | | | | | | A-WEIGHTED SOUND POWER LEVEL | | 55.8 | |

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

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 11 of 16

| MEASURED TIME AVERAGED SPL at 1 m, L'P - [06681/3_3 – Eco Setting] | | | | | | | | | | | | Mean L _P over mic positions | ΔL _P [dB] | BG corr. K ₁ , [dB] | Env corr. K ₂ , [dB] | L _P [dB] | Sound Power, L _w [dB] | A-weighting corrections [dB] | Sound Power, L _{wA} [dB] |
|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|------|--|----------------------|--------------------------------|---------------------------------|---------------------|----------------------------------|------------------------------|-----------------------------------|
| Frequency [Hz] | Mic 1 [dB] | Mic 2 [dB] | Mic 3 [dB] | Mic 4 [dB] | Mic 5 [dB] | Mic 6 [dB] | Mic 7 [dB] | Mic 8 [dB] | Mic 9 [dB] | Mic 10 [dB] | | | | | | | | | |
| 100 | 20.1 | 18.0 | 16.8 | 18.2 | 16.2 | 16.7 | 15.3 | 17.0 | 14.7 | 16.1 | 17.2 | 4.4 | 1.30 | -2.4 | 18.3 | 31.1 | -19.1 | 12.0 | |
| 125 | 21.1 | 20.3 | 18.9 | 20.6 | 17.9 | 18.4 | 19.5 | 18.6 | 17.7 | 14.9 | 19.1 | 12.3 | 0.27 | 1.2 | 17.7 | 30.5 | -16.1 | 14.4 | |
| 160 | 23.9 | 20.9 | 21.2 | 22.6 | 20.8 | 21.4 | 20.3 | 17.9 | 18.6 | 15.2 | 20.8 | 17.9 | 0.00 | 0.6 | 20.3 | 33.1 | -13.4 | 19.7 | |
| 200 | 25.0 | 24.5 | 24.3 | 23.5 | 23.3 | 24.4 | 21.8 | 21.0 | 20.1 | 16.1 | 23.0 | 27.3 | 0.00 | 1.3 | 21.7 | 34.5 | -10.9 | 23.6 | |
| 250 | 26.7 | 27.1 | 26.6 | 25.0 | 22.5 | 23.8 | 24.4 | 20.8 | 21.9 | 19.2 | 24.5 | 30.2 | 0.00 | 1.4 | 23.0 | 35.9 | -8.6 | 27.3 | |
| 315 | 34.7 | 36.2 | 33.7 | 32.3 | 35.0 | 34.6 | 28.8 | 32.6 | 29.3 | 30.0 | 33.4 | 41.2 | 0.00 | -0.5 | 33.9 | 46.7 | -6.6 | 40.1 | |
| 400 | 28.6 | 28.7 | 27.9 | 27.0 | 26.6 | 27.2 | 22.5 | 23.0 | 21.8 | 23.7 | 26.4 | 34.6 | 0.00 | 0.6 | 25.7 | 38.6 | -4.8 | 33.8 | |
| 500 | 31.5 | 31.7 | 29.7 | 25.7 | 26.6 | 28.0 | 24.8 | 21.9 | 25.2 | 31.4 | 28.7 | 37.3 | 0.00 | 0.2 | 28.5 | 41.4 | -3.2 | 38.2 | |
| 630 | 34.5 | 34.6 | 30.4 | 29.7 | 24.9 | 28.4 | 32.4 | 31.5 | 32.5 | 36.8 | 32.6 | 41.7 | 0.00 | -0.3 | 32.9 | 45.7 | -1.9 | 43.8 | |
| 800 | 34.0 | 35.2 | 29.7 | 28.8 | 27.7 | 26.6 | 30.1 | 36.8 | 31.7 | 31.7 | 32.4 | 41.3 | 0.00 | -0.4 | 32.8 | 45.7 | -0.8 | 44.9 | |
| 1000 | 32.8 | 33.7 | 29.4 | 28.7 | 31.4 | 28.1 | 30.4 | 37.1 | 31.1 | 31.6 | 32.3 | 40.4 | 0.00 | -0.9 | 33.2 | 46.0 | 0 | 46.0 | |
| 1250 | 33.0 | 31.6 | 30.2 | 33.7 | 34.7 | 32.5 | 31.4 | 35.2 | 32.1 | 32.0 | 32.9 | 40.4 | 0.00 | -0.7 | 33.6 | 46.4 | 0.6 | 47.0 | |
| 1600 | 38.3 | 31.1 | 35.0 | 36.9 | 35.1 | 34.4 | 34.9 | 34.2 | 32.8 | 30.3 | 34.9 | 41.8 | 0.00 | -0.2 | 35.1 | 48.0 | 1 | 49.0 | |
| 2000 | 34.8 | 28.5 | 31.7 | 32.1 | 29.1 | 30.0 | 31.4 | 28.1 | 31.1 | 27.2 | 31.0 | 37.2 | 0.00 | 0.3 | 30.6 | 43.5 | 1.2 | 44.7 | |
| 2500 | 29.4 | 26.3 | 27.8 | 26.8 | 22.9 | 24.8 | 27.6 | 25.1 | 24.9 | 20.9 | 26.2 | 31.7 | 0.00 | -0.3 | 26.5 | 39.4 | 1.3 | 40.7 | |
| 3150 | 24.8 | 25.0 | 23.1 | 25.2 | 22.7 | 22.6 | 23.0 | 21.4 | 23.3 | 19.0 | 23.3 | 28.2 | 0.00 | 0.1 | 23.2 | 36.1 | 1.2 | 37.3 | |
| 4000 | 20.4 | 25.0 | 21.7 | 22.3 | 22.4 | 21.2 | 20.2 | 20.7 | 22.1 | 19.5 | 21.8 | 26.1 | 0.00 | 0.4 | 21.4 | 34.2 | 1 | 35.2 | |
| 5000 | 18.6 | 15.7 | 19.6 | 18.3 | 15.1 | 17.5 | 18.2 | 16.4 | 19.0 | 13.7 | 17.6 | 21.5 | 0.00 | -0.8 | 18.4 | 31.2 | 0.5 | 31.7 | |
| 6300 | 17.2 | 15.5 | 14.8 | 16.6 | 12.6 | 15.6 | 14.5 | 12.1 | 14.2 | 10.3 | 14.8 | 18.9 | 0.00 | -0.5 | 15.2 | 28.1 | -0.1 | 28.0 | |
| 8000 | 12.0 | 10.5 | 10.4 | 11.1 | 7.1 | 9.0 | 9.8 | 6.0 | 9.9 | 4.8 | 9.6 | 13.3 | 0.21 | -0.2 | 9.5 | 22.4 | -1.1 | 21.3 | |
| 10000 | 6.4 | 4.2 | 6.2 | 7.1 | 4.4 | 5.6 | 5.0 | 2.8 | 5.6 | 1.4 | 5.2 | 7.9 | 0.77 | 0.1 | 4.3 | 17.1 | -2.5 | 14.6 | |
| A-WEIGHTED SOUND POWER LEVEL | | | | | | | | | | | | | | | | 54.7 | | | |

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

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 12 of 16

| MEASURED TIME AVERAGED SPL at 1 m, L_p - [06681/3_4 – Auto Setting] | | | | | | | | | | | | Mean L_p over mic positions | ΔL_p [dB] | BG corr. K_1 , [dB] | Env corr. K_2 , [dB] | L_p [dB] | Sound Power, L_w [dB] | A-weighting corrections [dB] | Sound Power, L_{wA} [dB] |
|---|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|------|-------------------------------|-------------------|-----------------------|------------------------|------------|-------------------------|------------------------------|----------------------------|
| Frequency [Hz] | Mic 1 [dB] | Mic 2 [dB] | Mic 3 [dB] | Mic 4 [dB] | Mic 5 [dB] | Mic 6 [dB] | Mic 7 [dB] | Mic 8 [dB] | Mic 9 [dB] | Mic 10 [dB] | | | | | | | | | |
| 100 | 21.3 | 17.8 | 16.5 | 19.2 | 17.2 | 17.1 | 16.4 | 17.4 | 15.2 | 16.8 | 17.8 | 5.1 | 1.30 | -2.4 | 18.9 | 31.7 | -19.1 | 12.6 | |
| 125 | 25.8 | 21.3 | 23.1 | 26.7 | 19.4 | 20.9 | 24.2 | 18.0 | 21.8 | 15.0 | 22.8 | 16.0 | 0.00 | 1.2 | 21.6 | 34.5 | -16.1 | 18.4 | |
| 160 | 23.9 | 20.5 | 20.8 | 22.7 | 20.6 | 21.3 | 20.2 | 17.6 | 18.5 | 14.5 | 20.7 | 17.8 | 0.00 | 0.6 | 20.1 | 33.0 | -13.4 | 19.6 | |
| 200 | 25.0 | 24.2 | 24.1 | 23.1 | 22.9 | 24.1 | 21.2 | 20.4 | 19.6 | 15.0 | 22.7 | 27.0 | 0.00 | 1.3 | 21.3 | 34.2 | -10.9 | 23.3 | |
| 250 | 26.7 | 27.0 | 26.5 | 24.9 | 22.4 | 23.7 | 24.3 | 20.8 | 21.8 | 19.0 | 24.4 | 30.1 | 0.00 | 1.4 | 22.9 | 35.8 | -8.6 | 27.2 | |
| 315 | 34.6 | 36.2 | 33.8 | 32.3 | 35.0 | 34.6 | 29.0 | 32.6 | 29.3 | 30.1 | 33.4 | 41.2 | 0.00 | -0.5 | 33.9 | 46.7 | -6.6 | 40.1 | |
| 400 | 28.5 | 28.7 | 28.0 | 27.0 | 26.6 | 27.2 | 22.5 | 23.1 | 22.0 | 23.7 | 26.4 | 34.6 | 0.00 | 0.6 | 25.7 | 38.6 | -4.8 | 33.8 | |
| 500 | 31.5 | 31.7 | 29.7 | 25.6 | 26.7 | 28.1 | 25.1 | 22.2 | 25.4 | 31.4 | 28.8 | 37.3 | 0.00 | 0.2 | 28.6 | 41.4 | -3.2 | 38.2 | |
| 630 | 34.4 | 34.8 | 30.5 | 30.1 | 26.2 | 29.6 | 32.9 | 32.0 | 32.5 | 36.9 | 32.9 | 42.0 | 0.00 | -0.3 | 33.1 | 46.0 | -1.9 | 44.1 | |
| 800 | 34.1 | 35.3 | 29.9 | 29.5 | 28.8 | 27.6 | 30.4 | 36.9 | 31.9 | 31.9 | 32.6 | 41.5 | 0.00 | -0.4 | 33.1 | 45.9 | -0.8 | 45.1 | |
| 1000 | 32.9 | 33.8 | 30.1 | 29.2 | 32.1 | 29.5 | 30.8 | 37.3 | 31.6 | 31.9 | 32.6 | 40.8 | 0.00 | -0.9 | 33.5 | 46.4 | 0 | 46.4 | |
| 1250 | 34.2 | 32.5 | 31.6 | 34.5 | 35.4 | 34.3 | 32.7 | 35.9 | 32.7 | 32.7 | 33.9 | 41.3 | 0.00 | -0.7 | 34.6 | 47.4 | 0.6 | 48.0 | |
| 1600 | 38.5 | 30.9 | 35.2 | 36.9 | 35.1 | 34.9 | 34.8 | 33.8 | 37.3 | 32.8 | 35.5 | 42.5 | 0.00 | -0.2 | 35.7 | 48.6 | 1 | 49.6 | |
| 2000 | 35.2 | 29.4 | 31.8 | 32.7 | 29.0 | 30.6 | 32.2 | 29.5 | 32.3 | 28.1 | 31.6 | 37.8 | 0.00 | 0.3 | 31.2 | 44.1 | 1.2 | 45.3 | |
| 2500 | 30.1 | 27.0 | 28.2 | 27.3 | 23.9 | 25.3 | 28.2 | 26.6 | 26.3 | 22.7 | 27.0 | 32.5 | 0.00 | -0.3 | 27.3 | 40.2 | 1.3 | 41.5 | |
| 3150 | 25.3 | 25.7 | 24.6 | 25.7 | 23.5 | 23.2 | 23.7 | 22.5 | 24.4 | 21.3 | 24.2 | 29.1 | 0.00 | 0.1 | 24.1 | 36.9 | 1.2 | 38.1 | |
| 4000 | 20.6 | 25.3 | 22.3 | 22.6 | 22.7 | 21.5 | 20.7 | 21.1 | 22.6 | 20.0 | 22.2 | 26.5 | 0.00 | 0.4 | 21.8 | 34.6 | 1 | 35.6 | |
| 5000 | 19.1 | 16.4 | 20.0 | 18.6 | 15.9 | 17.9 | 18.6 | 16.9 | 19.4 | 14.3 | 18.0 | 22.0 | 0.00 | -0.8 | 18.8 | 31.7 | 0.5 | 32.2 | |
| 6300 | 17.4 | 16.4 | 15.5 | 16.8 | 13.2 | 16.0 | 14.9 | 13.3 | 14.8 | 11.2 | 15.3 | 19.5 | 0.00 | -0.5 | 15.8 | 28.6 | -0.1 | 28.5 | |
| 8000 | 12.3 | 11.0 | 11.1 | 11.3 | 7.8 | 9.6 | 10.3 | 7.2 | 10.5 | 5.4 | 10.1 | 13.8 | 0.18 | -0.2 | 10.1 | 23.0 | -1.1 | 21.9 | |
| 10000 | 6.7 | 5.1 | 7.0 | 7.3 | 4.7 | 5.9 | 5.3 | 3.7 | 5.9 | 1.5 | 5.6 | 8.3 | 0.69 | 0.1 | 4.8 | 17.6 | -2.5 | 15.1 | |

A-WEIGHTED SOUND POWER LEVEL **55.3**

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

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 13 of 16

| MEASURED TIME AVERAGED SPL at 1 m, L'P - [06681/3_5 – Full Setting] | | | | | | | | | | | | Mean L _P over mic positions | ΔL _P [dB] | BG corr. K ₁ , [dB] | Env corr. K ₂ , [dB] | L _P [dB] | Sound Power, L _w [dB] | A-weighting corrections [dB] | Sound Power, L _{wA} [dB] |
|---|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|------|--|----------------------|--------------------------------|---------------------------------|---------------------|----------------------------------|------------------------------|-----------------------------------|
| Frequency [Hz] | Mic 1 [dB] | Mic 2 [dB] | Mic 3 [dB] | Mic 4 [dB] | Mic 5 [dB] | Mic 6 [dB] | Mic 7 [dB] | Mic 8 [dB] | Mic 9 [dB] | Mic 10 [dB] | | | | | | | | | |
| 100 | 23.5 | 18.5 | 17.9 | 22.1 | 17.6 | 17.3 | 18.4 | 19.2 | 17.7 | 18.0 | 19.6 | 6.8 | 1.01 | -2.4 | 20.9 | 33.8 | -19.1 | 14.7 | |
| 125 | 28.0 | 25.0 | 25.1 | 28.3 | 23.4 | 23.8 | 25.9 | 23.0 | 24.3 | 18.7 | 25.2 | 18.4 | 0.00 | 1.2 | 24.1 | 36.9 | -16.1 | 20.8 | |
| 160 | 29.3 | 26.0 | 26.4 | 28.1 | 26.3 | 27.2 | 25.6 | 23.5 | 23.7 | 20.0 | 26.3 | 23.3 | 0.00 | 0.6 | 25.7 | 38.5 | -13.4 | 25.1 | |
| 200 | 31.1 | 30.7 | 30.2 | 29.3 | 29.3 | 30.4 | 27.4 | 26.7 | 25.6 | 21.0 | 28.9 | 33.2 | 0.00 | 1.3 | 27.6 | 40.4 | -10.9 | 29.5 | |
| 250 | 33.8 | 34.8 | 32.9 | 31.5 | 29.7 | 30.4 | 31.1 | 28.2 | 28.3 | 24.9 | 31.4 | 37.1 | 0.00 | 1.4 | 29.9 | 42.8 | -8.6 | 34.2 | |
| 315 | 33.4 | 33.1 | 31.4 | 31.7 | 29.7 | 30.3 | 29.4 | 27.3 | 26.8 | 26.7 | 30.6 | 38.4 | 0.00 | -0.5 | 31.1 | 43.9 | -6.6 | 37.3 | |
| 400 | 36.7 | 36.5 | 37.0 | 35.5 | 34.0 | 35.6 | 31.3 | 29.5 | 30.2 | 33.1 | 34.6 | 42.9 | 0.00 | 0.6 | 34.0 | 46.9 | -4.8 | 42.1 | |
| 500 | 46.3 | 47.8 | 47.4 | 43.1 | 45.5 | 46.1 | 39.9 | 41.2 | 39.3 | 43.0 | 44.9 | 53.4 | 0.00 | 0.2 | 44.7 | 57.5 | -3.2 | 54.3 | |
| 630 | 40.9 | 41.1 | 38.2 | 36.1 | 32.5 | 36.3 | 38.7 | 36.6 | 38.7 | 43.2 | 39.1 | 48.2 | 0.00 | -0.3 | 39.4 | 52.2 | -1.9 | 50.3 | |
| 800 | 42.7 | 43.7 | 38.2 | 37.4 | 36.1 | 34.8 | 38.7 | 45.3 | 40.1 | 40.0 | 40.9 | 49.8 | 0.00 | -0.4 | 41.4 | 54.2 | -0.8 | 53.4 | |
| 1000 | 44.7 | 45.0 | 40.6 | 39.3 | 42.2 | 38.2 | 41.3 | 46.8 | 41.9 | 42.8 | 43.0 | 51.2 | 0.00 | -0.9 | 43.9 | 56.8 | 0 | 56.8 | |
| 1250 | 42.9 | 41.4 | 39.9 | 43.4 | 44.2 | 42.3 | 40.9 | 44.1 | 41.7 | 41.7 | 42.4 | 49.9 | 0.00 | -0.7 | 43.1 | 56.0 | 0.6 | 56.6 | |
| 1600 | 44.3 | 39.0 | 41.0 | 46.7 | 44.3 | 44.1 | 44.0 | 40.3 | 45.0 | 40.2 | 43.5 | 50.5 | 0.00 | -0.2 | 43.7 | 56.6 | 1 | 57.6 | |
| 2000 | 44.7 | 37.9 | 42.1 | 41.7 | 38.0 | 40.6 | 41.6 | 38.6 | 42.1 | 37.9 | 41.1 | 47.3 | 0.00 | 0.3 | 40.7 | 53.6 | 1.2 | 54.8 | |
| 2500 | 40.8 | 37.9 | 39.3 | 38.4 | 34.2 | 36.4 | 39.0 | 36.2 | 35.9 | 31.8 | 37.6 | 43.2 | 0.00 | -0.3 | 38.0 | 50.8 | 1.3 | 52.1 | |
| 3150 | 37.4 | 37.8 | 35.8 | 38.0 | 35.5 | 35.3 | 35.7 | 33.8 | 36.0 | 31.2 | 36.0 | 40.9 | 0.00 | 0.1 | 35.9 | 48.8 | 1.2 | 50.0 | |
| 4000 | 34.6 | 38.8 | 35.6 | 36.1 | 36.1 | 35.2 | 34.1 | 34.4 | 35.8 | 33.0 | 35.6 | 39.9 | 0.00 | 0.4 | 35.2 | 48.1 | 1 | 49.1 | |
| 5000 | 33.3 | 30.3 | 34.3 | 33.0 | 29.8 | 32.1 | 33.1 | 31.0 | 33.8 | 28.3 | 32.2 | 36.2 | 0.00 | -0.8 | 33.0 | 45.9 | 0.5 | 46.4 | |
| 6300 | 32.1 | 31.1 | 29.8 | 31.3 | 27.7 | 30.2 | 29.7 | 27.0 | 29.7 | 25.0 | 29.8 | 34.0 | 0.00 | -0.5 | 30.3 | 43.1 | -0.1 | 43.0 | |
| 8000 | 29.4 | 27.2 | 26.8 | 27.9 | 23.5 | 25.9 | 26.4 | 22.3 | 26.5 | 20.9 | 26.3 | 30.0 | 0.00 | -0.2 | 26.5 | 39.3 | -1.1 | 38.2 | |
| 10000 | 24.0 | 21.2 | 23.4 | 24.5 | 21.2 | 22.8 | 21.8 | 18.8 | 22.2 | 17.0 | 22.2 | 24.9 | 0.00 | 0.1 | 22.0 | 34.9 | -2.5 | 32.4 | |

A-WEIGHTED SOUND POWER LEVEL **64.5**

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

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 14 of 16

| MEASURED TIME AVERAGED SPL at 1 m, L_p - [06681/3_6 – TV25 Setting] | | | | | | | | | | | | Mean L_p over mic positions | ΔL_p [dB] | BG corr. K_1 , [dB] | Env corr. K_2 , [dB] | L_p [dB] | Sound Power, L_w [dB] | A-weighting corrections [dB] | Sound Power, L_{wA} [dB] |
|---|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|------|-------------------------------|-------------------|-----------------------|------------------------|------------|-------------------------|------------------------------|----------------------------|
| Frequency [Hz] | Mic 1 [dB] | Mic 2 [dB] | Mic 3 [dB] | Mic 4 [dB] | Mic 5 [dB] | Mic 6 [dB] | Mic 7 [dB] | Mic 8 [dB] | Mic 9 [dB] | Mic 10 [dB] | | | | | | | | | |
| 100 | 21.0 | 16.9 | 16.2 | 19.4 | 16.7 | 17.5 | 15.8 | 17.0 | 15.0 | 14.4 | 17.4 | 4.7 | 1.30 | -2.4 | 18.5 | 31.4 | -19.1 | 12.3 | |
| 125 | 23.6 | 21.5 | 21.0 | 23.5 | 19.9 | 20.6 | 21.5 | 20.1 | 20.2 | 15.0 | 21.2 | 14.4 | 0.16 | 1.2 | 19.9 | 32.7 | -16.1 | 16.6 | |
| 160 | 26.7 | 23.2 | 23.7 | 25.4 | 23.5 | 24.4 | 22.9 | 20.3 | 21.1 | 16.7 | 23.5 | 20.5 | 0.00 | 0.6 | 22.9 | 35.8 | -13.4 | 22.4 | |
| 200 | 28.3 | 27.6 | 27.5 | 26.6 | 26.4 | 27.6 | 24.5 | 23.7 | 22.8 | 17.8 | 26.1 | 30.3 | 0.00 | 1.3 | 24.7 | 37.6 | -10.9 | 26.7 | |
| 250 | 30.3 | 30.8 | 29.8 | 28.4 | 25.9 | 27.1 | 27.8 | 24.0 | 25.2 | 21.5 | 27.9 | 33.6 | 0.00 | 1.4 | 26.5 | 39.3 | -8.6 | 30.7 | |
| 315 | 31.9 | 32.0 | 31.1 | 30.4 | 30.1 | 30.4 | 27.6 | 27.8 | 25.8 | 26.1 | 29.8 | 37.7 | 0.00 | -0.5 | 30.3 | 43.2 | -6.6 | 36.6 | |
| 400 | 38.8 | 40.7 | 41.0 | 37.6 | 39.0 | 39.8 | 33.1 | 34.9 | 31.7 | 34.3 | 38.1 | 46.3 | 0.00 | 0.6 | 37.5 | 50.3 | -4.8 | 45.5 | |
| 500 | 39.9 | 41.4 | 40.7 | 37.1 | 38.6 | 40.2 | 33.6 | 33.9 | 33.1 | 37.9 | 38.5 | 47.1 | 0.00 | 0.2 | 38.3 | 51.2 | -3.2 | 48.0 | |
| 630 | 37.6 | 37.8 | 34.7 | 32.6 | 28.6 | 32.4 | 35.3 | 33.2 | 35.3 | 39.8 | 35.7 | 44.8 | 0.00 | -0.3 | 36.0 | 48.8 | -1.9 | 46.9 | |
| 800 | 40.9 | 41.8 | 36.1 | 35.5 | 34.2 | 32.4 | 36.0 | 43.3 | 37.8 | 38.1 | 38.9 | 47.8 | 0.00 | -0.4 | 39.3 | 52.2 | -0.8 | 51.4 | |
| 1000 | 39.8 | 40.1 | 35.9 | 35.0 | 37.4 | 33.6 | 36.2 | 43.0 | 37.1 | 38.1 | 38.5 | 46.6 | 0.00 | -0.9 | 39.4 | 52.2 | 0 | 52.2 | |
| 1250 | 39.0 | 37.5 | 35.8 | 39.6 | 40.4 | 38.5 | 36.9 | 40.6 | 38.0 | 38.2 | 38.7 | 46.2 | 0.00 | -0.7 | 39.4 | 52.3 | 0.6 | 52.9 | |
| 1600 | 41.0 | 35.3 | 38.4 | 43.3 | 40.4 | 40.5 | 39.8 | 39.9 | 39.4 | 36.6 | 40.0 | 46.9 | 0.00 | -0.2 | 40.2 | 53.0 | 1 | 54.0 | |
| 2000 | 40.1 | 33.8 | 37.5 | 38.2 | 34.1 | 36.4 | 37.5 | 34.5 | 37.5 | 34.0 | 36.9 | 43.1 | 0.00 | 0.3 | 36.5 | 49.4 | 1.2 | 50.6 | |
| 2500 | 36.4 | 33.5 | 34.9 | 34.1 | 29.8 | 32.0 | 34.6 | 31.9 | 31.5 | 27.3 | 33.3 | 38.8 | 0.00 | -0.3 | 33.6 | 46.4 | 1.3 | 47.7 | |
| 3150 | 32.6 | 33.1 | 31.0 | 33.2 | 30.8 | 30.5 | 30.9 | 29.1 | 31.2 | 26.4 | 31.2 | 36.1 | 0.00 | 0.1 | 31.1 | 44.0 | 1.2 | 45.2 | |
| 4000 | 29.6 | 33.9 | 30.7 | 31.3 | 31.1 | 30.3 | 29.1 | 29.4 | 30.9 | 28.0 | 30.7 | 35.0 | 0.00 | 0.4 | 30.3 | 43.1 | 1 | 44.1 | |
| 5000 | 27.9 | 25.0 | 28.9 | 27.7 | 24.5 | 26.8 | 27.7 | 25.6 | 28.4 | 22.9 | 26.9 | 30.9 | 0.00 | -0.8 | 27.7 | 40.5 | 0.5 | 41.0 | |
| 6300 | 26.5 | 25.5 | 24.3 | 26.0 | 22.2 | 24.7 | 24.2 | 21.6 | 24.1 | 19.5 | 24.3 | 28.4 | 0.00 | -0.5 | 24.8 | 37.6 | -0.1 | 37.5 | |
| 8000 | 23.6 | 21.3 | 21.0 | 22.0 | 17.7 | 20.1 | 20.6 | 16.3 | 20.7 | 15.2 | 20.5 | 24.2 | 0.00 | -0.2 | 20.7 | 33.5 | -1.1 | 32.4 | |
| 10000 | 17.9 | 15.4 | 17.3 | 18.5 | 15.1 | 16.8 | 15.7 | 12.8 | 16.2 | 11.1 | 16.1 | 18.9 | 0.00 | 0.1 | 16.0 | 28.9 | -2.5 | 26.4 | |

A-WEIGHTED SOUND POWER LEVEL **60.6**

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

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 15 of 16

| MEASURED TIME AVERAGED SPL at 1 m, L_p - [06681/3_7 - TV35 Setting] | | | | | | | | | | | | Mean L_p over mic positions | ΔL_p [dB] | BG corr. K_1 , [dB] | Env corr. K_2 , [dB] | L_p [dB] | Sound Power, L_w [dB] | A-weighting corrections [dB] | Sound Power, L_{wA} [dB] |
|---|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|------|-------------------------------|-------------------|-----------------------|------------------------|------------|-------------------------|------------------------------|----------------------------|
| Frequency [Hz] | Mic 1 [dB] | Mic 2 [dB] | Mic 3 [dB] | Mic 4 [dB] | Mic 5 [dB] | Mic 6 [dB] | Mic 7 [dB] | Mic 8 [dB] | Mic 9 [dB] | Mic 10 [dB] | | | | | | | | | |
| 100 | 19.3 | 17.3 | 15.9 | 17.5 | 17.2 | 18.3 | 14.7 | 16.5 | 13.4 | 13.3 | 16.7 | 4.0 | 1.30 | -2.4 | 17.8 | 30.6 | -19.1 | 11.5 | |
| 125 | 20.4 | 18.6 | 17.8 | 20.5 | 16.6 | 17.5 | 18.7 | 16.9 | 17.2 | 11.9 | 18.1 | 11.3 | 0.33 | 1.2 | 16.6 | 29.5 | -16.1 | 13.4 | |
| 160 | 23.6 | 20.1 | 20.6 | 22.3 | 20.3 | 21.0 | 19.8 | 17.1 | 18.1 | 13.9 | 20.4 | 17.4 | 0.00 | 0.6 | 19.8 | 32.6 | -13.4 | 19.2 | |
| 200 | 24.7 | 24.0 | 23.9 | 23.0 | 22.8 | 24.1 | 21.2 | 20.3 | 19.3 | 14.7 | 22.5 | 26.8 | 0.00 | 1.3 | 21.2 | 34.0 | -10.9 | 23.1 | |
| 250 | 26.6 | 26.9 | 26.4 | 24.8 | 22.2 | 23.6 | 24.2 | 20.4 | 21.6 | 18.5 | 24.3 | 30.0 | 0.00 | 1.4 | 22.8 | 35.7 | -8.6 | 27.1 | |
| 315 | 34.5 | 36.1 | 33.7 | 32.2 | 34.9 | 34.5 | 28.7 | 32.6 | 29.1 | 30.0 | 33.3 | 41.1 | 0.00 | -0.5 | 33.8 | 46.6 | -6.6 | 40.0 | |
| 400 | 28.5 | 28.5 | 27.8 | 27.0 | 26.5 | 27.1 | 22.4 | 22.9 | 21.7 | 23.6 | 26.3 | 34.5 | 0.00 | 0.6 | 25.6 | 38.5 | -4.8 | 33.7 | |
| 500 | 31.5 | 31.7 | 29.7 | 25.7 | 26.5 | 28.0 | 24.8 | 21.7 | 25.1 | 31.4 | 28.7 | 37.2 | 0.00 | 0.2 | 28.5 | 41.3 | -3.2 | 38.1 | |
| 630 | 34.5 | 34.6 | 30.5 | 29.6 | 25.0 | 28.4 | 32.4 | 31.4 | 32.5 | 36.7 | 32.6 | 41.7 | 0.00 | -0.3 | 32.9 | 45.7 | -1.9 | 43.8 | |
| 800 | 34.1 | 35.2 | 29.7 | 28.9 | 27.7 | 26.4 | 30.1 | 36.8 | 31.7 | 31.7 | 32.4 | 41.3 | 0.00 | -0.4 | 32.9 | 45.7 | -0.8 | 44.9 | |
| 1000 | 32.9 | 33.7 | 29.5 | 29.0 | 31.5 | 28.2 | 30.5 | 37.2 | 31.2 | 31.6 | 32.3 | 40.5 | 0.00 | -0.9 | 33.2 | 46.1 | 0 | 46.1 | |
| 1250 | 33.1 | 31.7 | 30.5 | 33.6 | 34.8 | 32.7 | 31.6 | 35.1 | 32.1 | 32.1 | 33.0 | 40.5 | 0.00 | -0.7 | 33.7 | 46.5 | 0.6 | 47.1 | |
| 1600 | 35.7 | 29.4 | 33.3 | 37.4 | 34.8 | 34.4 | 34.3 | 33.9 | 33.7 | 30.9 | 34.3 | 41.2 | 0.00 | -0.2 | 34.5 | 47.3 | 1 | 48.3 | |
| 2000 | 34.5 | 28.9 | 31.6 | 32.7 | 28.7 | 29.9 | 31.4 | 28.4 | 31.4 | 28.1 | 31.0 | 37.3 | 0.00 | 0.3 | 30.7 | 43.5 | 1.2 | 44.7 | |
| 2500 | 29.3 | 26.3 | 27.6 | 26.8 | 22.8 | 24.8 | 27.6 | 25.2 | 24.7 | 20.6 | 26.2 | 31.7 | 0.00 | -0.3 | 26.5 | 39.3 | 1.3 | 40.6 | |
| 3150 | 24.8 | 25.1 | 23.2 | 25.1 | 22.7 | 22.5 | 23.0 | 21.2 | 23.2 | 18.9 | 23.3 | 28.2 | 0.00 | 0.1 | 23.2 | 36.0 | 1.2 | 37.2 | |
| 4000 | 20.9 | 25.1 | 21.9 | 22.6 | 22.4 | 21.3 | 20.4 | 20.8 | 22.4 | 19.6 | 22.0 | 26.3 | 0.00 | 0.4 | 21.6 | 34.4 | 1 | 35.4 | |
| 5000 | 18.5 | 15.7 | 19.6 | 18.4 | 15.1 | 17.5 | 18.3 | 16.2 | 19.0 | 13.5 | 17.5 | 21.5 | 0.00 | -0.8 | 18.3 | 31.2 | 0.5 | 31.7 | |
| 6300 | 17.2 | 15.8 | 14.8 | 16.8 | 12.9 | 15.5 | 14.6 | 12.3 | 14.5 | 10.6 | 14.9 | 19.1 | 0.00 | -0.5 | 15.4 | 28.2 | -0.1 | 28.1 | |
| 8000 | 13.1 | 11.1 | 11.0 | 11.5 | 7.5 | 10.4 | 11.4 | 6.3 | 11.3 | 6.1 | 10.5 | 14.2 | 0.17 | -0.2 | 10.5 | 23.4 | -1.1 | 22.3 | |
| 10000 | 8.4 | 7.4 | 7.0 | 8.3 | 5.3 | 7.0 | 5.4 | 3.3 | 7.2 | 2.3 | 6.5 | 9.3 | 0.54 | 0.1 | 5.9 | 18.7 | -2.5 | 16.2 | |
| A-WEIGHTED SOUND POWER LEVEL | | | | | | | | | | | | | | | | 54.6 | | | |

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

Test Report

Issued by University of Salford (Acoustics Test Laboratory)

Date of Issue: 8th August 2024

Report Number: 06681/03 Rev.2

Page 16 of 16

Appendix 3 – Measured time averaged sound pressure level of RSS, $L'_{P(RSS)}$ at each microphone position

| Frequency | Mic 1 | Mic 2 | Mic 3 | Mic 4 | Mic 5 | Mic 6 | Mic 7 | Mic 8 | Mic 9 | Mic 10 | Average $L'_{P(RSS)}$ over microphone positions | Calculated Sound Power of RSS |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---|-------------------------------|
| [Hz] | [dB] | [dB] | [dB] |
| 100 | 63.7 | 60.7 | 60.1 | 62.6 | 60.5 | 59.3 | 59.1 | 61.7 | 57.7 | 55.2 | 60.6 | 73.5 |
| 125 | 65.0 | 65.0 | 63.5 | 64.2 | 64.1 | 64.2 | 62.2 | 64.9 | 62.9 | 56.7 | 63.7 | 76.6 |
| 160 | 65.8 | 63.9 | 63.9 | 64.0 | 66.1 | 65.5 | 61.8 | 62.7 | 61.2 | 57.9 | 63.8 | 76.7 |
| 200 | 65.2 | 66.7 | 66.3 | 63.6 | 66.4 | 66.8 | 61.4 | 64.7 | 60.5 | 56.5 | 64.7 | 77.5 |
| 250 | 65.6 | 67.7 | 66.6 | 64.1 | 64.2 | 65.0 | 63.5 | 63.3 | 61.5 | 58.7 | 64.6 | 77.5 |
| 315 | 64.6 | 65.1 | 64.0 | 62.8 | 63.2 | 63.6 | 61.3 | 62.0 | 60.0 | 60.0 | 63.0 | 75.8 |
| 400 | 66.4 | 66.2 | 65.9 | 64.9 | 64.4 | 65.3 | 59.9 | 61.9 | 59.2 | 58.8 | 64.1 | 76.9 |
| 500 | 67.2 | 66.4 | 65.7 | 63.9 | 63.2 | 64.6 | 59.8 | 60.6 | 59.7 | 60.1 | 64.0 | 76.8 |
| 630 | 66.4 | 66.8 | 65.7 | 63.2 | 62.0 | 63.7 | 62.1 | 59.7 | 62.7 | 64.0 | 64.1 | 77.0 |
| 800 | 66.8 | 68.0 | 65.1 | 61.5 | 60.4 | 62.9 | 65.9 | 62.8 | 66.6 | 67.5 | 65.4 | 78.3 |
| 1000 | 67.0 | 68.5 | 64.1 | 60.0 | 60.9 | 60.1 | 68.8 | 67.1 | 68.3 | 65.1 | 66.1 | 78.9 |
| 1250 | 67.4 | 68.2 | 60.9 | 66.7 | 68.0 | 64.8 | 69.3 | 70.8 | 66.8 | 69.4 | 67.9 | 80.7 |
| 1600 | 63.6 | 64.6 | 65.1 | 71.0 | 71.2 | 69.9 | 67.2 | 67.9 | 69.5 | 68.5 | 68.5 | 81.4 |
| 2000 | 65.4 | 61.7 | 69.3 | 71.3 | 70.0 | 70.8 | 69.4 | 67.0 | 68.6 | 65.9 | 68.7 | 81.6 |
| 2500 | 66.7 | 62.8 | 69.0 | 66.5 | 65.3 | 67.6 | 65.9 | 67.9 | 65.1 | 62.7 | 66.4 | 79.2 |
| 3150 | 68.1 | 68.3 | 68.0 | 66.8 | 67.7 | 65.6 | 65.3 | 66.7 | 63.9 | 61.0 | 66.6 | 79.4 |
| 4000 | 66.6 | 69.7 | 65.5 | 68.0 | 67.5 | 67.4 | 65.6 | 66.3 | 64.3 | 61.1 | 66.7 | 79.5 |
| 5000 | 64.5 | 64.6 | 66.2 | 66.0 | 65.5 | 65.8 | 64.8 | 65.5 | 63.7 | 58.9 | 64.9 | 77.7 |
| 6300 | 66.2 | 65.0 | 65.3 | 64.7 | 64.2 | 64.8 | 61.7 | 63.6 | 61.6 | 57.5 | 64.0 | 76.8 |
| 8000 | 65.3 | 63.0 | 63.3 | 62.7 | 62.7 | 62.9 | 61.7 | 62.4 | 61.4 | 55.6 | 62.6 | 75.4 |
| 10000 | 61.9 | 61.0 | 62.3 | 61.6 | 61.2 | 61.6 | 59.4 | 61.0 | 59.7 | 54.2 | 60.8 | 73.6 |

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