

sharps acoustics

**ME Group Uk, Epsom -
Revolution Wash Kiosk
Study**

Source measurements of sample equipment

Dominic Attwell BEng. (Hons) MIOA
Acoustic Consultant

Sharps Acoustics LLP
197 Sidegate Lane, Ipswich Suffolk IP4 4JN
T 01473 314123
E info@sharpsacoustics.com W sharpsacoustics.com

23rd July 2026

1.0 Survey Details

- 1.1 Sharps Acoustics LLP (SAL) have been instructed to carry out source measurements of a sample Revolution Wash Kiosk unit at ME Group UK, 3B Blenheim Rd, Epsom KT19 9AP.
- 1.2 The aim of the measurements was to capture unit operating levels under various loads, and at various angles/distances, under controlled, quiet conditions.
- 1.3 The site study was conducted 16th July 2026. The recording equipment used for the survey was a 01dB FUSION sound level meter. The equipment was calibrated before and after the survey with no significant drift. The noise monitoring equipment used during the survey is shown in Table 1.1, and was set to record a number of parameters, including the $L_{Aeq,T}$, L_{A90} , L_{A10} and L_{AFmax} .

Table 1.1: Survey Equipment

Equipment Description	Serial Number	Calibration Date Prior to Survey	Calibrator Reference Level
01dB FUSION sound level meter	16830	22/03/2026	-
GRAS 40CD microphone	629613	27/03/2026	-
01dB CAL 31	95670	29/08/2025	94 dB

- 1.4 For information purposes it can be noted:
- Measurements of sound level were all made with the A-weighting, which is a filter applied to the sound level meter to simulate the frequency response of the human ear, which is more sensitive to high frequency sound than low.
 - L_{Aeq} is the equivalent continuous noise level which is a method of averaging the varying noise level over the measurement period into a single figure value. The L_{Aeq} has the same sound energy as the fluctuating level over that period. The L_{Aeq} is also known as the “ambient level” and in BS 4142 the L_{Aeq} in the absence of the proposed development sound is known as the “residual level”.
- 1.5 The wash kiosk was sited within a quiet warehouse, with a residual sound level (average sound level with equipment switched off) measured between 37 – 40 dB $L_{Aeq,T}$.
- 1.6 The equipment was sited away from walls and other objects, with a clearance of:
- Right hand side (RHS) = >2m
 - Front side (FS) = >3m
 - Left hand side (LHS) = >6m
 - Rear side (RS) = ~1m
- 1.7 The clearance was deemed suitable for noise source measurement, where the majority of Revolution Wash units are sited up against a wall or building with a (10 - 15cm air gap).

- 1.8 Average sound measurements were conducted over a full wash/dry cycle.
- 1.9 All drums were filled with clothes, to demonstrate the unit operating under a typical load.
- 1.10 Sound measurements were carried out around FS, LHS and RHS of the unit at a set distance. Additional measurements were made at various distances from the FS and LHS of the unit to analyse the contribution from the dryer exhaust, sited on at the bottom of the LHS panel.

2.0 Survey Results and Acoustic Characteristics

- 2.1 Single figure measurements at each kiosk elevation have been summarised in the tables below (all drums running and just wash drums running):

Table 2.1: Summary of noise measurements (all drums running)

All Drums Running – Noise Measurement Summary		
Measurement Description	Distance from Source (m)	$L_{Aeq,T}$
Front side (FS)	10	42
Left hand side (LHS)	10	48
Right hand side (RHS)	10	37
Rear side (RS)	10	37

Table 2.2: Summary of noise measurements (just wash drums running)

Both Wash Drums (No Dryer) – Noise Measurement Summary		
Measurement Description	Distance from Source (m)	$L_{Aeq,T}$
Front side (FS)	10	41
Left hand side (LHS)	10	37
Right hand side (RHS)	10	37

- 2.2 The 1/1 octave band centre frequency results for the worst-case operation have been provided in Figure A1 in the Appendix.

Tonality Assessment

- 2.3 The sounds emitting from the wash kiosk were not noted to contain any acoustically distinguishable tonality close to the source; however, to inform a robust assessment, an objective assessment of tonality has been undertaken based on the “One-third octave method” presented in Annex C of BS 4142:2014+A1:2019.
- 2.4 As defined by BS 4142:2014, the test for the presence of a prominent, discrete-frequency spectral component (tone) compares the time-average linear sound pressure levels ($L_{Zeq,T}$) in a one-third-octave band with sound pressure levels in the adjacent one-third-octave bands. For a tone to be identified, the

sound pressure level in the one-third-octave band of interest is required to exceed the sound pressure levels of both adjacent one-third-octave bands by a certain level difference.

- 2.5 The measured one-third octave band sound pressure levels of the wash kiosk (shown in Table A1 in the Appendix) have been reviewed using the above methodology. It has been shown in Tables A2 – A4 that a prominent tone was not present in front of the kiosk or close to the dryer exhaust vent.
- 2.6 It has therefore been concluded that the sound produced by the wash kiosks units would not require a tonal character correction according to both subjective and objective methodology (as specified in BS 4142:2014).

Appendix: Survey Results and Figures

Figure A1: Summary of measurements with all drums running

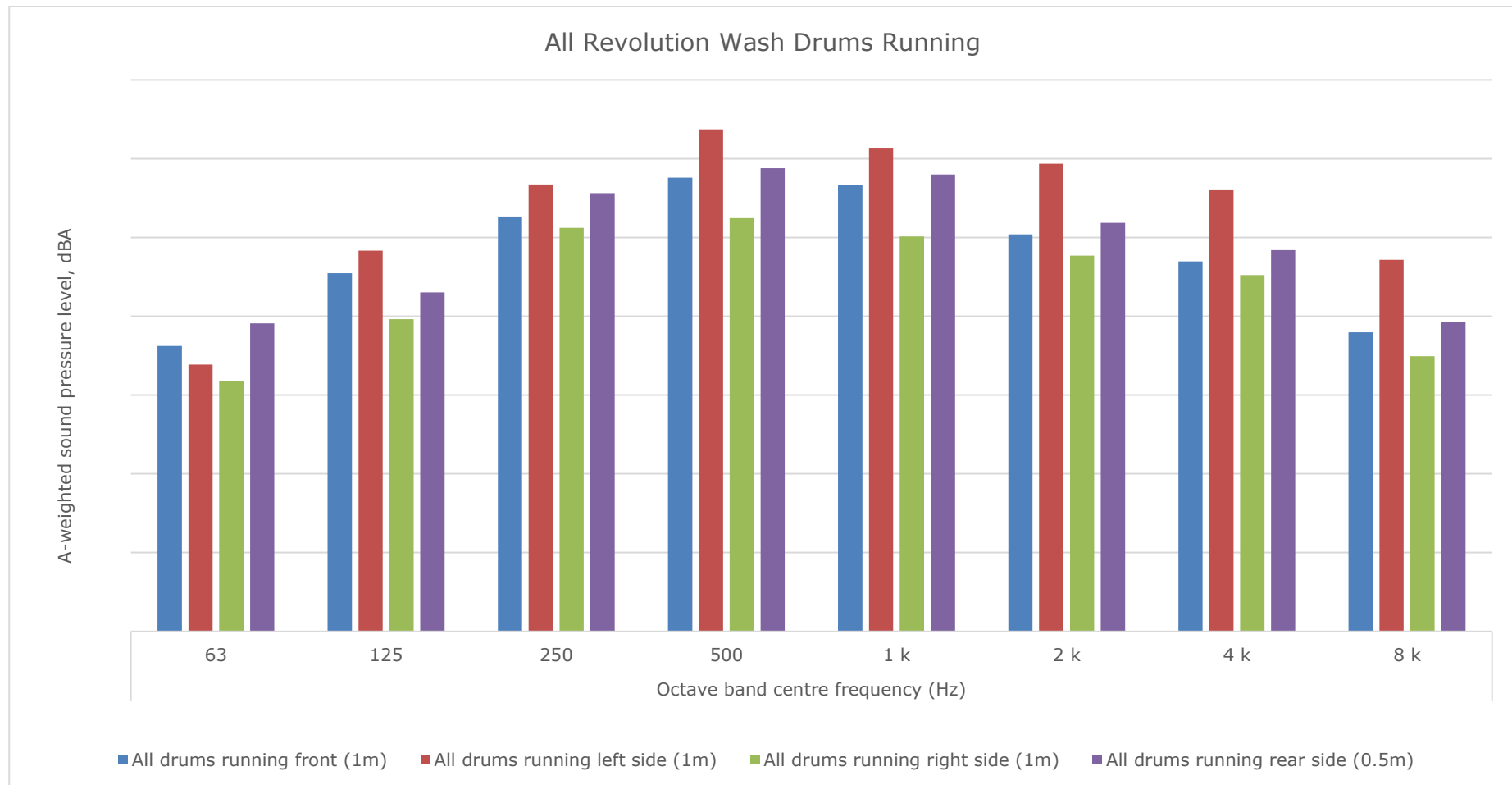


Table A1: Overview of wash kiosk source measurements (1/3 octave band centre frequency values)

Source	Sound pressure level, dB																															
	1/3 octave band centre frequency (Hz)																															
	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.3k	1.6k	2k	2.5k	3.2k	4k	5k	6.3k	8k	10k
Front	46	50	56	60	69	55	52	57	57	58	60	58	54	56	61	56	56	55	52	51	51	49	47	48	47	44	44	42	46	42	41	
Exhaust	42	41	48	50	55	50	57	58	58	53	53	55	59	62	60	59	62	57	61	65	58	56	56	53	54	53	51	50	49	46	42	39

Objective method for assessing the audibility of tones in sound: One-third octave method

As defined by BS 4142:2014+A1:2019, the test for the presence of a prominent, discrete-frequency spectral component (tone) compares the ($L_{Zeq,T}$) sound pressure level averaged over the time in a one-third-octave band with the time-average linear sound pressure levels in the adjacent one-third-octave bands.

For a prominent tone to be identified, the time-averaged sound pressure level in the one-third-octave band of interest is required to exceed the time-averaged sound pressure levels of both adjacent one-third-octave bands by a certain level difference, as listed below:

- 15 dB in the low-frequency one-third-octave bands (25 Hz to 125 Hz);
- 8 dB in middle-frequency one-third-octave bands (160 Hz to 400 Hz);
- 5 dB in high-frequency one-third-octave bands (500 Hz to 10 000 Hz).

The measured 1/3 octave band sound pressure levels of the operating Revolution Wash Kiosk have been provided in Table A2 above. The presence of a tone has been calculated using the one third octave method, with the calculations shown in three-parts the in Tables A2 – A4 below:

Table A2 – Tonality Assessment of wash kiosk using the “Objective One-Third Octave Method” (8 Hz - 125 Hz)

Tonality Assessment: Objective One-Third Octave Method (8 Hz - 125 Hz: 15 dB level difference in both adjacent bands)														
Measurement description	Linear sound pressure level, dB													
	1/3 octave band centre frequency (Hz)													
		10		16		25		40		63		100		
	8		12.5		20		31.5		50		80		125	
Front	-	-	-	-	15	-8	2	9	5	5	6	2	2	-1
Exhaust	6	14	9	9	11	1	13	6	4	-1	3	6	8	5

Table A3 – Tonality Assessment of wash kiosk using the “Objective One-Third Octave Method” (160 Hz - 400 Hz).

Tonality Assessment: Objective One-Third Octave Method (160 Hz - 400 Hz: 8 dB level difference in both adjacent bands)						
Measurement description	Linear sound pressure level, dB					
	1/3 octave band centre frequency (Hz)					
	160		250		400	
		200		315		
Front	-1	5	7	-3	2	1
Exhaust	5	0	2	5	-3	5

Table A4 – Tonality Assessment of wash kiosk using the “Objective One-Third Octave Method” (500 Hz - 10 kHz).

Tonality Assessment: Objective One-Third Octave Method (500 Hz - 10 kHz: 5 dB level difference in both adjacent bands)															
Measurement description	Linear sound pressure level, dB														
	1/3 octave band centre frequency (Hz)														
		630		1 k		1.6 k		2.5 k		4 k		6.3 k		10 k	
	500		800		1.25 k		2 k		3.15 k		5 k		8 k		
Front	1	-2	0	0	-1	-1	1	-1	-3	0	-3	4	-5	-3	3
Exhaust	5	5	-6	-1	1	-2	1	-1	-2	-1	-1	-4	-5	-4	-2

The difference calculations in the above tables have not revealed a prominent tone from the kiosk sound emissions (at the exhaust or at the front of the unit), where the time-averaged sound pressure levels of both adjacent one-third-octave bands have not exceeded the specified constant values.