

APPENDIX C
COPIES OF CALIBRATION
CERTIFCATES

Certificate of Calibration

Certificate No. ATS25-008-CC001

Customer: Ka Shing Facilities Management Limited

Flat C, 14/F., Jing Ho Industrial Building,
78-84 Wing Lung Street, Tsuen Wan,
N.T., Hong Kong

Unit-under-test (UUT):

Description:	Sound Analyzer	,	Microphone	,	Pre-amplifier
Manufacturer:	Rion				
Type No.:	NL-53	,	UC-59	,	NH-25
Serial No.:	01130782	,	24906	,	33673

Conditions during calibration:

Temperature:	23°C
Relative Humidity:	65%

Test Specifications: Calibration Check

Date of Calibration: 23 January 2025

Test Results: All calibration points are within manufacturer's specification.

Certified by:



Mr. Ching Mau LAM / Quality Manager
MIOA, MHKIOA



Issue Date: 24 January 2025

1. The instrument under test was allowed to stabilize in the laboratory for over 24 hours.
2. Calibration equipment:

Description: Sound Calibrator
Manufacturer & Type: Brüel & Kjær 4231
Serial No.: 2478237
Last Calibration Date: 27 February 2024
Certificate No.: AV240026

The calibration equipment used for calibration is traceable to National Standards via Standards and Calibration Laboratory, the Government of the HKSAR.

3. The Sound Analyzer has been calibrated in accordance with the requirements as specified in IEC 61672-1 Class 1, and vendor specific procedures.
4. The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted, if any, will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. Acoustic Testing Services Limited shall not be liable for any loss or damage resulting from the use of the equipment.
5. Calibration Results

Setting of unit-under-test (UUT)				Applied value		UUT Reading, dB	IEC 61672-1 Class 1 Tolerance Limits, dB	Conclusion
Range, dB	Parameter	Frequency Weighting	Response	Level, dB	Frequency, Hz			
30-130	SPL	A	F	94.00	1000	94.0	± 0.7	PASS
			S			94.0	± 0.7	PASS
			I			94.0	± 0.7	PASS
		C	F			94.0	± 0.7	PASS
			S			94.0	± 0.7	PASS
			I			94.0	± 0.7	PASS
		L	F			94.0	± 0.7	PASS
			S			94.0	± 0.7	PASS
			I			94.0	± 0.7	PASS
		A	F	114.00	1000	114.0	± 0.7	PASS
			S			114.0	± 0.7	PASS
			I			114.0	± 0.7	PASS

All calibration points are within manufacturer's specification.



Certificate of Calibration

Certificate No. ATS24-112-CC001

Customer: **Ka Shing Facilities Management Limited**
Flat C, 14/F., Jing Ho Industrial Building,
78-84 Wing Lung Street, Tsuen Wan,
N.T., Hong Kong

Unit-under-test (UUT):

Description: Sound Calibrator
Manufacturer: SoundTEK
Type No.: ST-120
Serial No.: 210102628

Conditions during calibration:

Temperature: 25°C
Relative Humidity: 50%

Test Specifications: Calibration Check

Date of Calibration: 11 November 2024

Test Results: All calibration points are within manufacturer's specification.

Certified by:


Mr. Ching Mau LAM / Quality Manager
MIOA, MHKIOA



Issue Date: 11 November 2024

1. The instrument under test was allowed to stabilize in the laboratory for over 24 hours.
2. Calibration equipment:

Description:	Sound Analyzer	Reference Microphone
Manufacturer:	Brüel & Kjær	Brüel & Kjær
Type No.:	2270	4189
Serial No.:	3001883	2662797
Last Calibration Date:	14 March 2024	14 March 2024
Certificate No.:	AV240037	AV240037

The calibration equipment used for calibration is traceable to National Standards via Standards and Calibration Laboratory, the Government of the HKSAR.

3. The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted, if any, will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. Acoustic Testing Services Limited shall not be liable for any loss or damage resulting from the use of the equipment.
4. Calibration Results

Nominal value dB	Measured value dB	IEC 60942 Class 1 Tolerance Limits dB	Conclusion	Expanded Measurement Uncertainty of Reference Microphone B&K 4189 at 1000 Hz dB
94.00	93.82	± 0.25	PASS	0.20
114.0	113.76	± 0.25	PASS	0.20

All calibration points are within manufacturer's specification.



High Precision Chemical Testing Ltd.

Rm 1904, Technology Park

18 On Lai Street, Shatin

NT, Hong Kong

Tel: +852 3841 4388 Website: <https://www.hpct.com.hk>

Report No. : 00657

Issue Date : 24 Apr 2024

Application No. : HP00516

Certificate of Calibration

Applicant : Ka Shing Facility Management Limited
Flat C, 14/ F, Jing Ho Industrial Building,
78-84 Wang Lung Street,
Tsuen Wan, N.T., Hong Kong

Sample Description : Submitted equipment stated to be Integrating Sound Level Meter.

Manufacturer: : BSWA Technology

Other information :

Model No.	BSWA 308
Serial No.	610062
Microphone No.	610373

Date Received : 16 Apr 2024

Test Period : 23 Apr 2024 to 23 Apr 2024

Test Requested : Performance checking for Sound Level Meter

Test Method : According to manufacturer instruction manual and internal method.

Test conditions : Room Temperature: 22-25 degree Celsius
Relative Humidity: 35-70%

Test Result : Refer to the test result(s) on page 2.

Remark : 1. Information of the sample description provided by the Applicant.
2. The result(s) relate only to the items tested or calibrated.

For and on behalf of
HIGH PRECISION CHEMICAL TESTING LIMITED

Lee Wai Kit
Laboratory Manager

High Precision Chemical Testing Ltd.

Rm 1904, Technology Park

18 On Lai Street, Shatin

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Report No. : 00657

Issue Date : 24 Apr 2024

Application No. : HP00516

Certificate of Calibration

Measuring
equipment

Description	Sound Calibrator
Manufacturer	Brüel & Kjær
Model No.	TYPE 4231
Serial No.	2326353
Equipment No.	N-02-01

Date of Calibration : 23 Apr 2024

Date of Recommended Re-Calibration : 23 Apr 2025

Test Result :

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB
94.0	94.0	± 0.0	± 1.5
114.0	114.1	+ 0.1	± 1.5

Note : 1. "Instrument Readings" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.
2. The indication value was obtained from the average of ten replicated measurement.

- End of report -

High Precision Chemical Testing Ltd.

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Tel: +852 3841 4388 Website: <https://www.hpct.com.hk>

Report No. : 00959
Application No. : HP00817

Issue Date : 23 Dec 2024

Certificate of Calibration

Applicant : Ka Shing Facility Management Limited
Flat C, 14/ F, Jing Ho Industrial Building,
78-84 Wang Lung Street,
Tsuen Wan, N.T., Hong Kong

Sample Description : Submitted equipment stated to be Dust Meter.

Manufacturer: : Met One Instruments

Other information : Model No.	Aerocet 831
Serial No.	D12641

Date Received : 12 Dec 2024

Test Period : 18 Dec 2024 to 22 Dec 2024

Test Requested : Performance checking for Dust Meter

Test Method : According to manufacturer instruction manual and internal method.

Test conditions : Environmental temperature: 20-35 degree Celsius
Relative Humidity: 35-85%

Test Result : Refer to the test result(s) on page 2.

Remark : 1. Information of the sample description provided by the Applicant.
2. The result(s) relate only to the items tested or calibrated.

For and on behalf of
HIGH PRECISION CHEMICAL TESTING LIMITED

Lee Wai Kit
Laboratory Manager

High Precision Chemical Testing Ltd.

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NT, Hong Kong

Tel: +852 3841 4388 Website: <https://www.hpct.com.hk>

Report No. : 00959
Application No. : HP00817

Issue Date : 23 Dec 2024

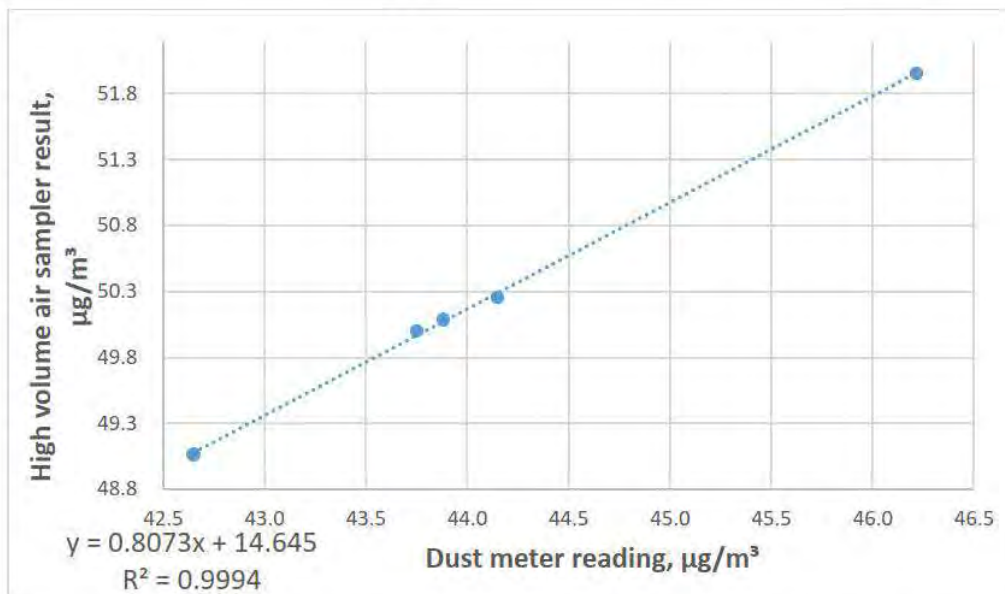
Certificate of CalibrationMeasuring
equipment

Description	High volume air sampler
Manufacturer	Tisch Environmental, Inc.
Model No.	TE-5170
Serial No.	10379

Date of Calibration : 18 Dec 2024 to 22 Dec 2024
Date of Recommended Re-Calibration : 22 Feb 2025

Test Result : 1 hour Total suspended particulate (TSP)

Calibration Point	Average Dust Meter reading, $\mu\text{g}/\text{m}^3$	High volume air sampler results, $\mu\text{g}/\text{m}^3$
1	44.2	50.3
2	46.2	52.0
3	43.9	50.1
4	42.7	49.1
5	43.8	50.0



- Note :**
1. "Instrument Readings" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.
 2. The coefficient of determination (R^2) of the calibration curve greater than 0.99 after a 5-point calibration, the dust meter complies with the specified requirements and deemed acceptable for use.

- End of report -

Certificate of Calibration

Calibration Certification Information

Cal. Date: January 15, 2024 Rootsmeter S/N: 438320 Ta: 294 °K
Operator: Jim Tisch Pa: 755.4 mm Hg
Calibration Model #: TE-5025A Calibrator S/N: 3864

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4380	3.3	2.00
2	3	4	1	1.0270	6.4	4.00
3	5	6	1	0.9180	8.0	5.00
4	7	8	1	0.8750	8.9	5.50
5	9	10	1	0.7230	12.9	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)}$ (y-axis)
1.0031	0.6975	1.4195	0.9956	0.6924	0.8823
0.9989	0.9727	2.0075	0.9915	0.9655	1.2477
0.9968	1.0858	2.2444	0.9894	1.0778	1.3950
0.9956	1.1378	2.3539	0.9882	1.1294	1.4631
0.9903	1.3697	2.8390	0.9829	1.3595	1.7645
QSTD	m=	2.11196	QA	m=	1.32248
	b=	-0.05043		b=	-0.03134
	r=	0.99998		r=	0.99998

Calculations

Vstd=	$\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$	Va=	$\Delta Vol((Pa-\Delta P)/Pa)$
Qstd=	Vstd/ΔTime	Qa=	Va/ΔTime
For subsequent flow rate calculations:			
Qstd=	$1/m \left(\left(\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)} \right) - b \right)$	Qa=	$1/m \left(\left(\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)} \right) - b \right)$

Standard Conditions

Tstd: 298.15 °K
Pstd: 760 mm Hg

Key

ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

RECALIBRATION

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

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Report No. : 00958

Issue Date : 19 Dec 2024

Internal Report
Certificate of Calibration

Description : Equipment stated to be High volume air sampler.

Manufacturer: : Tisch Environmental, Inc.

Other information :

Model No.	TE-5170
Serial No.	10379

Test Period : 18 Dec 2024 to 18 Dec 2024

Test Requested : Performance checking for High volume air sampler

Test Method : According to manufacturer instruction manual and internal method.

Test conditions : Environmental temperature: 20-35 degree Celsius
Relative Humidity: 35-85%

Test Result : Refer to the test result(s) on page 2.

Remark : The result(s) relate only to the items tested or calibrated.

For and on behalf of
HIGH PRECISION CHEMICAL TESTING LIMITED

Lee Wai Kit
Laboratory Manager

Report No. : 00958

Issue Date : 19 Dec 2024

Internal Report

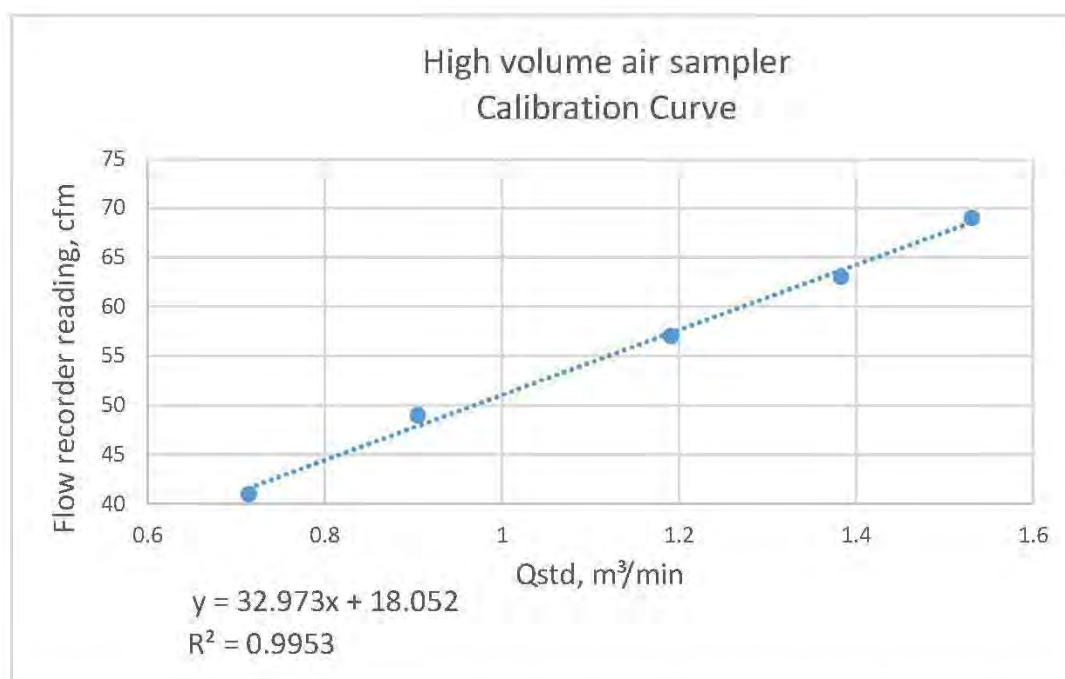
Certificate of Calibration

Measuring
equipment

Description	Calibration Orifice
Manufacturer	Tisch Environmental, Inc.
Model No.	TE-5025A
Serial No.	3864

Test Result :

Qstd, Actual flow rate, m ³ /min	1.531	1.383	1.191	0.905	0.714
Flow recorder reading, cfm	69	63	57	49	41
Pressure, mm Hg	750				
Temperature, K	302				



Note : The coefficient of determination (R^2) of the calibration curve greater than 0.99 after a 5-point calibration, the high volume air sampler complies with the specified requirements and deemed acceptable for use.

- End of report -