

**APPENDIX C**  
**COPIES OF CALIBRATION**  
**CERTIFICATES**

# 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
<b>QSTD</b>	m=	<b>2.11196</b>	<b>QA</b>	m=	<b>1.32248</b>
	b=	<b>-0.05043</b>		b=	<b>-0.03134</b>
	r=	<b>0.99998</b>		r=	<b>0.99998</b>

## 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
<b>Key</b>	
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

**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. : 00655

Issue Date : 22 Apr 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 : 19 Apr 2024 to 19 Apr 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

## 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. : 00655

Issue Date : 22 Apr 2024

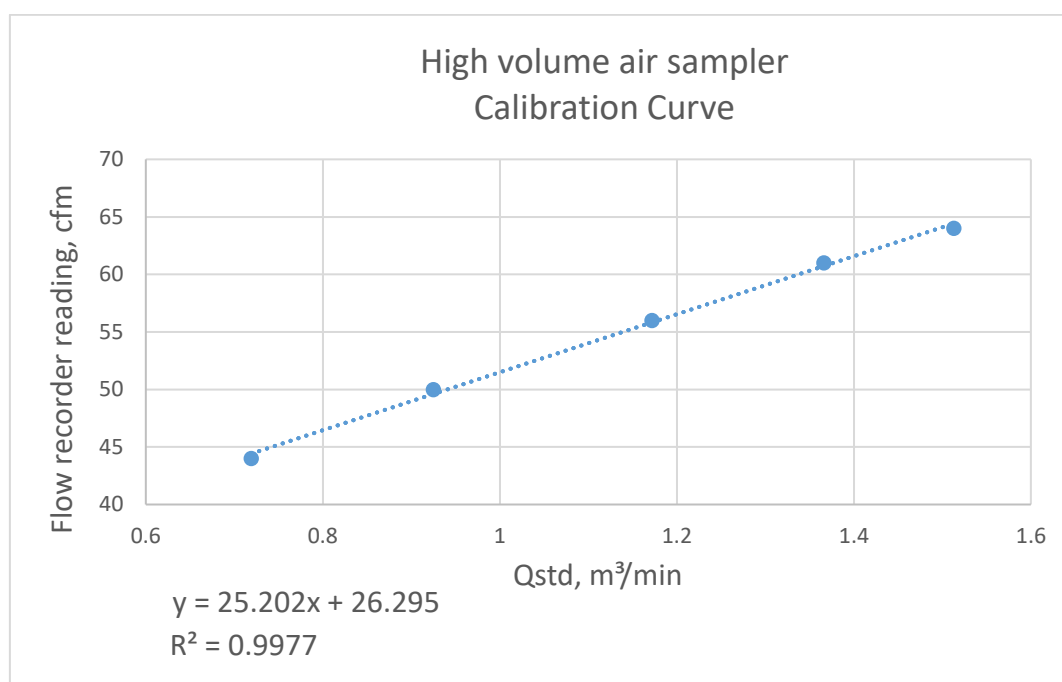
### Internal Report Certificate of Calibration

Measuring  
equipment

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

Test Result :

Qstd, Actual flow rate, m <sup>3</sup> /min	1.513	1.366	1.172	0.925	0.719
Flow recorder reading, cfm	64	61	56	50	44
Pressure, mm Hg	757				
Temperature, K	303				



**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 -

**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. : 00876

Issue Date : 21 Oct 2024

Application No. : HP00735

**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.	E11304

Date Received : 10 Oct 2024

Test Period : 16 Oct 2024 to 21 Oct 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.

Rm 1904, Technology Park

18 On Lai Street, Shatin

NT, Hong Kong

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



Report No. : 00876

Issue Date : 21 Oct 2024

Application No. : HP00735

### Certificate of Calibration

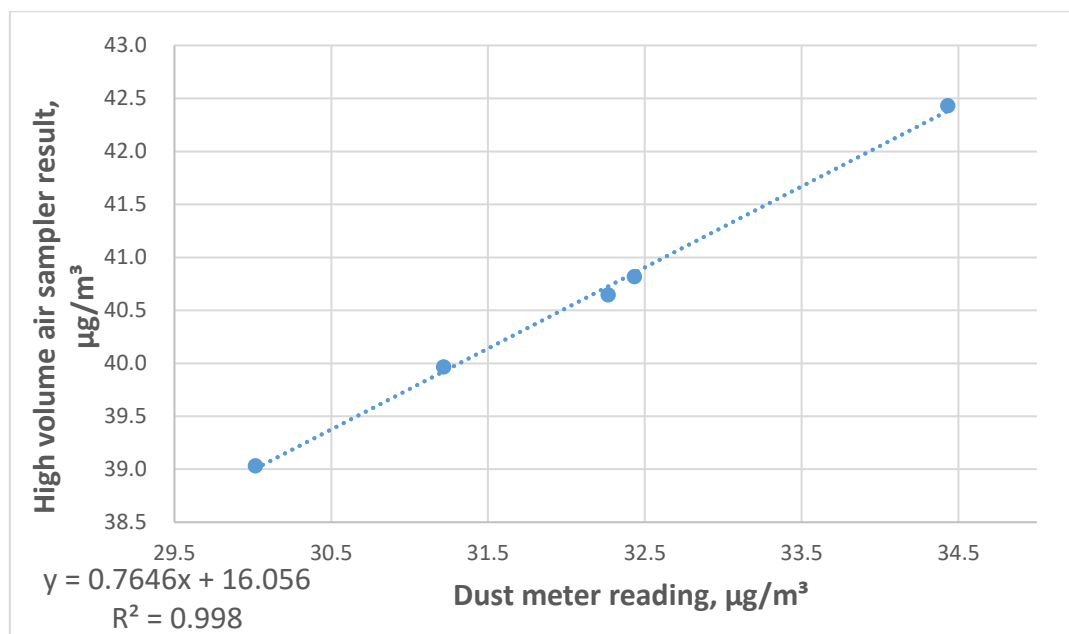
Measuring equipment	Description	High volume air sampler
	Manufacturer	Tisch Environmental, Inc.
	Model No.	TE-5170
	Serial No.	10379

Date of Calibration : 16 Oct 2024 to 21 Oct 2024

Date of Recommended Re-Calibration : 21 Dec 2024

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	31.2	40.0
2	30.0	39.0
3	32.4	40.8
4	34.4	42.4
5	32.3	40.6



- 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 -

## **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

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**

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 -



# Certificate of Calibration

Certificate No. ATS24-012-CC012

**Customer:** **Urban Green Consultants Limited**  
23/F., Wui Tat Centre,  
55 Connaught Road West, Sheung Wan,  
Hong Kong

---

**Unit-under-test (UUT):**

**Description:** Acoustic Calibrator  
**Manufacturer:** CASELLA  
**Type No.:** CEL-120/1  
**Serial No.:** 4884880

---

**Conditions during calibration:**

**Temperature:** 25°C  
**Relative Humidity:** 65%

---

**Test Specifications:** Calibration Check

---

**Date of Calibration:** 06 June 2024

---

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

---

**Certified by:** 

**Mr. Y. T. Leung / Technical Manager**  
MIOA, MHKIOA, MHKIQEP



**Issue Date: 07 June 2024**

**Calibration Information:**

**Calibration Day: 06 June 2024**

**Due Day: 05 June 2025**

**Cert. No.: ATS24-012-CC012**

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

2. Calibration equipment:

<b>Description:</b>	Sound Analyzer	Reference Microphone
<b>Manufacturer:</b>	Brüel & Kjær	Brüel & Kjær
<b>Type No.:</b>	2270	4189
<b>Serial No.:</b>	3001883	2662797
<b>Last Calibration Date:</b>	14 March 2024	14 March 2024
<b>Certificate No.:</b>	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	94.20	± 0.25	PASS	0.20
114.0	114.20	± 0.25	PASS	0.20

All calibration points are within manufacturer's specification.