

**CERTIFICATE OF CALIBRATION**

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler, hereinafter ("HVS")

Equipment Calibrated:		Standard Equipment:	
Type:	Dust Monitor System	Type:	High Volume Sampler
Model:	OC-9200	Model:	TE 5170
Equipment No.:	A-06-03	Equipment No.:	A-01-75
Serial No.:	OC20210316224101	Serial No.:	3499
Sensitivity.:	0.001mg/m3	Tisch Calibration Orifice No.:	3864

Date of Calibration:	19-Dec-25
Validity of Calibration Record:	19-Feb-26

**Calibration**

Calibration Points:	Time Minutes	High Volume Sampler	Dust Monitor System
		Mass concentration [ $\mu\text{g}/\text{m}^3$ ]	Mass concentration [ $\mu\text{g}/\text{m}^3$ ]
		y Axis	x Axis
0	60	0	0
1	60	96.0	37.0
2	60	135.0	49.0
3	60	209.0	75.0
Average	60	110.0	40.3

With the aid of the mathematical model of Simple Linear Regression, the following values are calculated as:

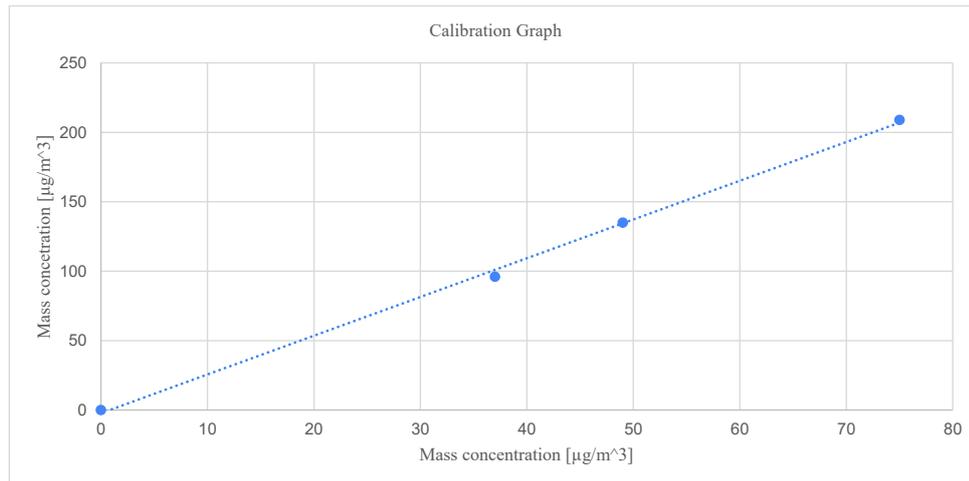
Slope:	2.78994768
Intercept:	-2.29539412
Correlation Coefficient:	0.99924834

**If the correlation coefficient is green (ie larger than 0.90), then no recalibration is required**

<b>Scale factor (K):</b>	<b>2.8</b>	(to one decimal point)
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Equation of line:

<b><math>y(\text{HVS})=3.6x(\text{OC-9200})</math></b>
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In-house method in according to the instruction manual:

The OC-9200 was compared with a calibrated HVS; the result has been used to calculate the scale factor and correlation coefficient between the two equipment.

**The filter papers are weighted by HOKLAS laboratory (HPCT Litimed)**

Recorded by:	Signature:	Date:
Technical Officer (Wong Shing Kwai)		19-Dec-25
Checked by:	Signature:	Date:
Project Manager (Henry Leung)		19-Dec-25

# High-Volume TSP Sampler

## 5-POINT CALIBRATION DATA SHEET



File No. MA20024/74/0013

Location: M-A3 - S.K.H Tsoi Kung Po Secondary School  
 Date: 8-Dec-25 Next Due Date: 8-Feb-26 Operator: SK  
 Equipment No.: A-01-74 Model No.: TE-5170 Serial No. 2204

Ambient Condition			
Temperature, Ta (K)	<b>303</b>	Pressure, Pa (mmHg)	<b>759.6</b>

Orifice Transfer Standard Information					
Serial No.	3864	Slope, mc	0.05914	Intercept, bc	-0.02377
Last Calibration Date:	7-Jan-25	$mc \times Q_{std} + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	7-Jan-26	$Q_{std} = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	$\Delta H$ (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	$\Delta W$ (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	<b>15.5</b>	3.90	66.40	<b>9.5</b>	3.06
2	<b>12.2</b>	3.46	58.96	<b>8.1</b>	2.82
3	<b>9.3</b>	3.02	51.53	<b>6.4</b>	2.51
4	<b>5.7</b>	2.37	40.43	<b>3.6</b>	1.88
5	<b>3.3</b>	1.80	30.86	<b>1.8</b>	1.33

### By Linear Regression of Y on X

Slope,  $m_w =$  0.0494 Intercept,  $b_w =$  -0.1344

Correlation coefficient\* = 0.9941

\*If Correlation Coefficient < 0.990, check and recalibrate.

### Set Point Calculation

From the TSP Field Calibration Curve, take  $Q_{std} = 43$  CFM

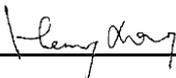
From the Regression Equation, the "Y" value according to

$$m_w \times Q_{std} + b_w = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point;  $W = (m_w \times Q_{std} + b_w)^2 \times (760 / Pa) \times (Ta / 298) =$  4.03

Remarks: \_\_\_\_\_  
 \_\_\_\_\_

Conducted by: Wong Shing Kwai Signature:  Date: 8-Dec-25

Checked by: Henry Leung Signature:  Date: 8-Dec-25



# Certificate of Calibration

Calibration Certification Information			
Cal. Date: January 7, 2025	Rootsmeter S/N: 438320	Ta: 293	°K
Operator: Jim Tisch		Pa: 759.0	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: <b>3864</b>		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4590	3.2	2.00
2	3	4	1	1.0360	6.4	4.00
3	5	6	1	0.9160	8.0	5.00
4	7	8	1	0.8800	8.8	5.50
5	9	10	1	0.7270	12.7	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)	$\sqrt{\Delta H (Ta/Pa)}$ (y-axis)
1.0114	0.6932	1.4252	0.9958	0.6825	0.8787
1.0071	0.9721	2.0156	0.9916	0.9571	1.2427
1.0050	1.0971	2.2535	0.9895	1.0802	1.3893
1.0039	1.1408	2.3635	0.9884	1.1232	1.4572
0.9987	1.3737	2.8505	0.9833	1.3525	1.7574
<b>QSTD</b>	m=	<b>2.08969</b>	<b>QA</b>	m=	<b>1.30853</b>
	b=	<b>-0.02374</b>		b=	<b>-0.01464</b>
	r=	<b>0.99985</b>		r=	<b>0.99985</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=	$1/m \left( \left( \sqrt{\Delta H (Ta/Pa)} \right) - b \right)$

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



# Certificate of Calibration

Calibration Certification Information			
Cal. Date: January 7, 2026	Rootsmer S/N: 438320	Ta: 294	°K
Operator: Jim Tisch		Pa: 749.0	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: <b>3864</b>		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4310	3.2	2.00
2	3	4	1	1.0260	6.4	4.00
3	5	6	1	0.9150	7.9	5.00
4	7	8	1	0.8730	8.8	5.50
5	9	10	1	0.7200	12.8	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)
0.9947	0.6951	1.4135	0.9957	0.6958	0.8860
0.9905	0.9654	1.9990	0.9915	0.9663	1.2530
0.9885	1.0803	2.2349	0.9895	1.0814	1.4009
0.9873	1.1309	2.3440	0.9883	1.1320	1.4693
0.9819	1.3638	2.8270	0.9829	1.3652	1.7720
<b>QSTD</b>	m=	<b>2.11337</b>	<b>QA</b>	m=	<b>1.32336</b>
	b=	<b>-0.04919</b>		b=	<b>-0.03083</b>
	r=	<b>0.99993</b>		r=	<b>0.99993</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
Key	
ΔH:	calibrator manometer reading (in H2O)
ΔP:	rootsmer 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

## Certificate of Calibration - Wind Monitoring Station

Description: M-A3 - S.K.H Tsoi Kung Po Secondary School  
 Model No.: C-OC-9200-wind  
 Serial No.: OC20210316224101  
 Equipment No.: A-06-03  
 Date of Calibration 19-Dec-2025  
 Next Due Date 19-Jun-2026

### 1. Performance check of Wind Speed

Wind Speed, m/s		Difference D (m/s)
Wind Speed Reading (V1)	Anemometer Value (V2)	$D = V1 - V2$
0.0	0.0	0.0
2.0	2.1	-0.1
3.0	3.0	0.0
4.0	4.1	-0.1

### 2. Performance check of Wind Direction

Wind Direction (°)		Difference D (°)
Wind Direction Reading (W1)	Marine Compass Value (W2)	$D = W1 - W2$
0	0	0.0
90	90	0.0
180	180	0.0
270	270	0.0

#### Test Specification:

1. Performance Wind Speed Test - The wind meter was on-site calibrated against the anemometer
2. Performance Wind Direction Test - The wind meter was on-site calibrated against the marine compass at four direction

## High Precision Chemical Testing Ltd.

Rm 1904, Technology Park  
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Tel: +852 3841 4388 Website: <https://www.hpct.com.hk>



Report No. : 01074  
Application No. : HP00912

Issue Date : 19 Mar 2025

### Certificate of Calibration

Applicant : Cinotech Consultants Limited  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

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

Equipment No.: : N-12-03

Manufacturer: : BSWA Technology

Other information :

Model No.	BSWA 308
Serial No.	570188
Microphone No.	570608

Date Received : 17 Mar 2025

Test Period : 18 Mar 2025 to 18 Mar 2025

Test Requested : Performance checking for Sound Level Meter

Test Method : The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard and instrument which are recommended by the manufacturer, or equivalent.

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**

A handwritten signature in black ink, appearing to read 'Lee Wai Kit', is written over a horizontal line.

Lee Wai Kit  
Laboratory Manager

## High Precision Chemical Testing Ltd.

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Report No. : 01074  
Application No. : HP00912

Issue Date : 19 Mar 2025

### Certificate of Calibration

Measuring equipment :

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

Test Result :

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB
94.0	93.9	- 0.1	± 1.5
114.0	114.0	± 0.0	± 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 -

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Report No. : 01075  
Application No. : HP00913

Issue Date : 19 Mar 2025

### Certificate of Calibration

Applicant : Cinotech Consultants Limited  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

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

Equipment No.: : N-12-04

Manufacturer: : BSWA Technology

Other information :

Model No.	BSWA 308
Serial No.	580238
Microphone No.	570605

Date Received : 17 Mar 2025

Test Period : 18 Mar 2025 to 18 Mar 2025

Test Requested : Performance checking for Sound Level Meter

Test Method : The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard and instrument which are recommended by the manufacturer, or equivalent.

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*  
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Laboratory Manager

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Report No. : 01075  
Application No. : HP00913

Issue Date : 19 Mar 2025

### Certificate of Calibration

Measuring equipment :

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

Test Result :

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB
94.0	94.2	+ 0.2	± 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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Report No. : 01015  
Application No. : HP00868

Issue Date : 04 Feb 2025

### Certificate of Calibration

Applicant : Cinotech Consultants Limited  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Sample Description : Submitted equipment stated to be Sound Level Calibrator.

Equipment No.: : N-16-02

Manufacturer: : Hangzhou Aihua Instruments Co., Ltd.

Other information :

Model No.	AWA6021A
Serial No.	1023064

Date Received : 28 Jan 2025

Test Period : 03 Feb 2025 to 04 Feb 2025

Test Requested : Performance checking for Sound Level Calibrator

Test Method : The Sound Level Meter and Calibrator has been calibrated in accordance with the documented procedures and using standard and instrument which are recommended by the manufacturer, or equivalent.

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**

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Lee Wai Kit  
Laboratory Manager

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



Report No. : 01015  
Application No. : HP00868

Issue Date : 04 Feb 2025

### Certificate of Calibration

Measuring equipment :

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

Description	Sound Meter
Manufacturer	SVANTEK
Model No.	SVAN 977
Serial No.	92677
Microphone No.	10352
Equipment No.	N-14-01

Test Result :

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB
94.0	94.2	+ 0.2	± 0.3
114.0	114.3	+ 0.3	± 0.5

**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 -