

# 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:	21-Aug-25
Validity of Calibration Record:	21-Oct-25

## Calibration

Calibration Points:	Time	High Volume Sampler	Dust Monitor System
	Minutes	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	215.0	75.0
2	60	130.0	48.0
3	60	94.0	36.0
Average	60	109.8	39.8

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

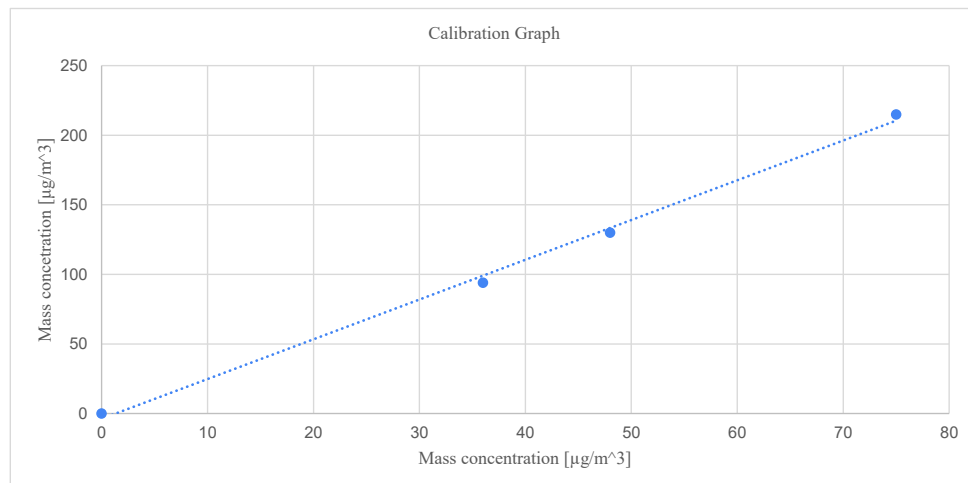
Slope:	2.85695843
Intercept:	-3.81409760
Correlation Coefficient:	0.99849416

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

<b>Scale factor (K):</b>	<b>2.9</b>	(to one decimal point)
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Equation of line:



$$y(\text{HVS})=3.6x(\text{OC-9200})$$



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)		21-Aug-25
Checked by:	Signature:	Date:
Project Manager (Henry Leung)		21-Aug-25

# 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:	21-Oct-25
Validity of Calibration Record:	21-Dec-25

## Calibration

Calibration Points:	Time	High Volume Sampler	Dust Monitor System
	Minutes	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	94.0	36.0
2	60	131.0	47.0
3	60	212.0	72.0
Average	60	109.3	38.8

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

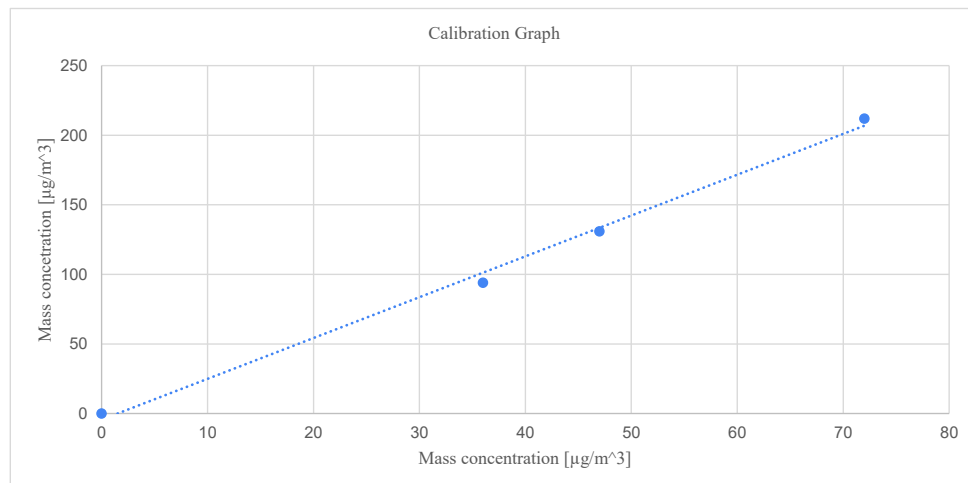
Slope:	2.93402292
Intercept:	-4.44338831
Correlation Coefficient:	0.99774903

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

<b>Scale factor (K):</b>	<b>2.9</b>	(to one decimal point)
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Equation of line:



$$y(\text{HVS})=3.6x(\text{OC-9200})$$



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)		21-Oct-25
Checked by:	Signature:	Date:
Project Manager (Henry Leung)		21-Oct-25

# High-Volume TSP Sampler

## 5-POINT CALIBRATION DATA SHEET



File No. MA20024/74/0011

Location. M-A3 - S.K.H Tsoi Kung Po Secondary School

Date: 8-Aug-25 Next Due Date: 8-Oct-25 Operator: SK

Equipment No.: A-01-74 Model No.: TE-5170 Serial No. 2204

Ambient Condition			
Temperature, Ta (K)	<b>302.8</b>	Pressure, Pa (mmHg)	<b>756.6</b>

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

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>15.7</b>	3.92	66.72	<b>9.5</b>	3.05
2	<b>12.5</b>	3.50	59.58	<b>8.0</b>	2.80
3	<b>9.5</b>	3.05	51.99	<b>6.4</b>	2.50
4	<b>5.8</b>	2.38	40.71	<b>3.6</b>	1.88
5	<b>3.3</b>	1.80	30.81	<b>1.9</b>	1.36

### By Linear Regression of Y on X


Slope, mw = 0.0477 Intercept, bw = -0.0661

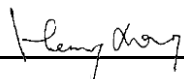
Correlation coefficient\* = 0.9962

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

Set Point Calculation	
From the TSP Field Calibration Curve, take Qstd = 43 CFM	
From the Regression Equation, the "Y" value according to	
$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$	
Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ <u>4.03</u>	

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

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

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

# High-Volume TSP Sampler

## 5-POINT CALIBRATION DATA SHEET



File No. MA20024/74/0012

Location: M-A3 - S.K.H Tsoi Kung Po Secondary School

Date: 8-Oct-25 Next Due Date: 8-Dec-25 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	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	7-Jan-26	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

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>15.6</b>	3.92	66.62	<b>9.4</b>	3.04
2	<b>12.3</b>	3.48	59.20	<b>8.2</b>	2.84
3	<b>9.4</b>	3.04	51.80	<b>6.5</b>	2.53
4	<b>5.6</b>	2.35	40.07	<b>3.5</b>	1.85
5	<b>3.2</b>	1.77	30.39	<b>1.7</b>	1.29

### By Linear Regression of Y on X


Slope, mw = 0.0495 Intercept, bw = -0.1430

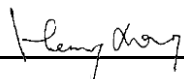
Correlation coefficient\* = 0.9923

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

Set Point Calculation	
From the TSP Field Calibration Curve, take Qstd = 43 CFM	
From the Regression Equation, the "Y" value according to	
$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$	
Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ <u>4.00</u>	

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

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

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



# Certificate of Calibration

**Calibration Certification Information**

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

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)	$\sqrt{\Delta H \left( \frac{Ta}{Pa} \right)}$ (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>	<b>m=</b>	<b>2.08969</b>	<b>QA</b>	<b>m=</b>	<b>1.30853</b>
	<b>b=</b>	<b>-0.02374</b>		<b>b=</b>	<b>-0.01464</b>
	<b>r=</b>	<b>0.99985</b>		<b>r=</b>	<b>0.99985</b>

**Calculations**

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

**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

**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: 20-Jun-2025  
Next Due Date: 20-Dec-2025

**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	2.2	-0.2
3.0	3.2	-0.2
4.0	4.2	-0.2

**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**

Calibrated by:



Wong Shing Kwai

Approved by:



Henry Leung

**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. : 01074

Issue Date : 19 Mar 2025

Application No. : HP00912

**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**

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. : 01074

Issue Date : 19 Mar 2025

Application No. : HP00912

**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 -



**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. : 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***  
**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. : 01075

Issue Date : 19 Mar 2025

Application No. : HP00913

### **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.**

Rm 1904, Technology Park

18 On Lai Street, Shatin

NT, Hong Kong

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

Report No. : 01015

Issue Date : 04 Feb 2025

Application No. : HP00868

**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**

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. : 01015

Issue Date : 04 Feb 2025

Application No. : HP00868

**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 -