

# High-Volume TSP Sampler

## 5-POINT CALIBRATION DATA SHEET



File No. MA16034/05/0043

Project No. AM1 - Tin Hau Temple  
 Date: 12-Aug-23 Next Due Date: 12-Oct-23 Operator: SK  
 Equipment No.: A-01-05 Model No.: GS2310 Serial No. 10599

Ambient Condition			
Temperature, Ta (K)	<b>302</b>	Pressure, Pa (mmHg)	<b>752.7</b>

Orifice Transfer Standard Information					
Serial No.	3864	Slope, mc	0.05928	Intercept, bc	-0.03491
Last Calibration Date:	16-Jan-23	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	16-Jan-24	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

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>13.2</b>	3.59	61.18	<b>9.2</b>	3.00
2	<b>10.6</b>	3.22	54.88	<b>7.0</b>	2.62
3	<b>7.5</b>	2.71	46.26	<b>5.0</b>	2.21
4	<b>5.5</b>	2.32	39.70	<b>3.0</b>	1.71
5	<b>3.0</b>	1.71	29.47	<b>1.6</b>	1.25

**By Linear Regression of Y on X**

Slope,  $m_w =$  0.0557 Intercept,  $b_w =$  -0.4223

Correlation coefficient\* = 0.9973

\*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

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

Therefore, Set Point;  $W = (m_w \times Qstd + b_w)^2 \times (760 / Pa) \times (Ta / 298) =$  3.99

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

Conducted by: Wong Shing Kwai Signature:  Date: 12-Aug-23

Checked by: Henry Leung Signature:  Date: 12-Aug-23

# High-Volume TSP Sampler

## 5-POINT CALIBRATION DATA SHEET



File No. MA16034/08/0043

Project No. AM2 - Sai Tso Wan Recreation Ground  
 Date: 12-Aug-23 Next Due Date: 12-Oct-23 Operator: SK  
 Equipment No.: A-01-08 Model No.: GS2310 Serial No. 1287

Ambient Condition			
Temperature, Ta (K)	<u>302</u>	Pressure, Pa (mmHg)	<u>752.7</u>

Orifice Transfer Standard Information					
Serial No.	<u>3864</u>	Slope, mc	<u>0.05928</u>	Intercept, bc	<u>-0.03491</u>
Last Calibration Date:	<u>16-Jan-23</u>	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	<u>16-Jan-24</u>	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

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	<u>13.3</u>	3.61	61.41	<u>9.0</u>	2.97
2	<u>10.4</u>	3.19	54.37	<u>6.6</u>	2.54
3	<u>7.6</u>	2.73	46.56	<u>4.9</u>	2.19
4	<u>5.3</u>	2.28	38.98	<u>3.2</u>	1.77
5	<u>3.0</u>	1.71	29.47	<u>1.7</u>	1.29

**By Linear Regression of Y on X**

Slope, mw = 0.0520 Intercept, bw : -0.2500  
 Correlation coefficient\* = 0.9993

\*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 x Qstd + bw) <sup>2</sup> x (760 / Pa) x (Ta / 298) =	<u>4.04</u>

Remarks: \_\_\_\_\_  
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Conducted by: Wong Shing Kwai Signature:  Date: 12-Aug-23  
 Checked by: Henry Leung Signature:  Date: 12-Aug-23

# High-Volume TSP Sampler

## 5-POINT CALIBRATION DATA SHEET



File No. MA16034/03/0043

Project No. AM3 - Yau Lai Estate, Bik Lai House  
 Date: 12-Aug-23 Next Due Date: 12-Oct-23 Operator: SK  
 Equipment No.: A-01-03 Model No.: GS2310 Serial No. 10379

Ambient Condition			
Temperature, Ta (K)	<b>302</b>	Pressure, Pa (mmHg)	<b>752.7</b>

Orifice Transfer Standard Information					
Serial No.	3864	Slope, mc	0.05928	Intercept, bc	-0.03491
Last Calibration Date:	16-Jan-23	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	16-Jan-24	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

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>12.9</b>	3.55	60.48	<b>8.6</b>	2.90
2	<b>10.2</b>	3.16	53.85	<b>6.4</b>	2.50
3	<b>8.2</b>	2.83	48.34	<b>4.6</b>	2.12
4	<b>5.2</b>	2.25	38.62	<b>2.9</b>	1.68
5	<b>2.8</b>	1.65	28.49	<b>1.7</b>	1.29

### By Linear Regression of Y on X

Slope,  $m_w =$  0.0502 Intercept,  $b_w =$  -0.2100

Correlation coefficient\* = 0.9934

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

### Set Point Calculation


From the TSP Field Calibration Curve, take Qstd = 43 CFM

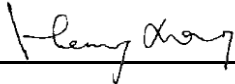
From the Regression Equation, the "Y" value according to

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

Therefore, Set Point;  $W = (m_w \times Qstd + b_w)^2 \times (760 / Pa) \times (Ta / 298) =$  3.89

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

Conducted by: Wong Shing Kwai Signature:  Date: 12-Aug-23

Checked by: Henry Leung Signature:  Date: 12-Aug-23

# High-Volume TSP Sampler

## 5-POINT CALIBRATION DATA SHEET



File No. MA20003/55/020

Project No. CKL 2 - Flat 103 Cha Kwo Ling Village  
 Date: 4-Jul-23 Next Due Date: 4-Sep-23 Operator: SK  
 Equipment No.: A-01-55 Model No.: TE 5170 Serial No. 1956

Ambient Condition			
Temperature, Ta (K)	<b>302.3</b>	Pressure, Pa (mmHg)	<b>756.6</b>

Orifice Transfer Standard Information					
Serial No.	3864	Slope, mc	0.05928	Intercept, bc	-0.03491
Last Calibration Date:	16-Jan-23	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	16-Jan-24	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

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>12.9</b>	3.56	60.61	<b>9.8</b>	3.10
2	<b>10.9</b>	3.27	55.76	<b>7.8</b>	2.77
3	<b>8.8</b>	2.94	50.16	<b>6.0</b>	2.43
4	<b>5.0</b>	2.22	37.96	<b>2.8</b>	1.66
5	<b>3.0</b>	1.72	29.53	<b>1.7</b>	1.29

**By Linear Regression of Y on X**

Slope, mw = 0.0589 Intercept, bw : -0.5059  
 Correlation coefficient\* = 0.9977

\*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 =  $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$  4.18

Remarks: \_\_\_\_\_  
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Conducted by: Wong Shing Kwai Signature:  Date: 4-Jul-23

Checked by: Henry Leung Signature:  Date: 4-Jul-23

# High-Volume TSP Sampler

## 5-POINT CALIBRATION DATA SHEET



File No. MA20003/55/021

Project No. CKL 2 - Flat 103 Cha Kwo Ling Village  
 Date: 4-Sep-23 Next Due Date: 4-Nov-23 Operator: SK  
 Equipment No.: A-01-55 Model No.: TE 5170 Serial No. 1956

Ambient Condition			
Temperature, Ta (K)	<b>302.9</b>	Pressure, Pa (mmHg)	<b>751.6</b>

Orifice Transfer Standard Information					
Serial No.	3864	Slope, mc	0.05928	Intercept, bc	-0.03491
Last Calibration Date:	16-Jan-23	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ $Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			
Next Calibration Date:	16-Jan-24				

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>13.1</b>	3.57	60.81	<b>9.7</b>	3.07
2	<b>11.1</b>	3.29	56.03	<b>7.7</b>	2.74
3	<b>8.9</b>	2.94	50.23	<b>5.9</b>	2.40
4	<b>5.2</b>	2.25	38.53	<b>2.7</b>	1.62
5	<b>3.2</b>	1.76	30.35	<b>1.6</b>	1.25

### By Linear Regression of Y on X

Slope, mw = 0.0606 Intercept, bw : -0.6460

Correlation coefficient\* = 0.9981

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

### Set Point Calculation


From the TSP Field Calibration Curve, take Qstd = 43 CFM

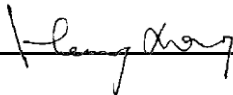
From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W =  $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$  3.95

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

Conducted by: Wong Shing Kwai Signature:  Date: 4-Jul-23

Checked by: Henry Leung Signature:  Date: 4-Jul-23

**Certificate of Calibration**

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

Description:	<u>Laser Dust Monitor</u>	Date of Calibration	<u>31-Jul-23</u>
Manufacturer:	<u>Sibata Scientific Technology LTD.</u>	Validity of Calibration Record	<u>30-Sep-23</u>
Model No.:	<u>LD-3B</u>		
Serial No.:	<u>2Y6194</u>		
Equipment No.:	<u>SA-01-02</u>	Sensitivity	<u>0.001 mg/m3</u>
High Volume Sampler No.:	<u>A-01-03</u>	Before Sensitivity Adjustment	<u>578</u>
Tisch Calibration Orifice No.:	<u>3864</u>	After Sensitivity Adjustment	<u>578</u>

Calibration of 1 hr TSP			
Calibration Point	Laser Dust Monitor		HVS
	Total Count	Count / Minute X-axis	Mass concentration (µg/m <sup>3</sup> ) Y-axis
1	4100	73.0	138.0
2	3700	64.0	120.0
3	3000	53.0	99.0
<b>Average</b>		<b>63.3</b>	<b>119.0</b>


By Linear Regression of Y on X  
 Slope , mw = 1.9485 Intercept, bw = -4.4053  
 Correlation coefficient\* = 0.9999

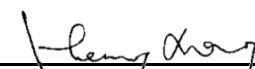
Set Correlation Factor , SCF  
 SCF = [ K=High Volume Sampler / Dust Meter, ( µ g/m3 ) ] 1.9

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

**Those filter papers are weighted by HOKLAS laboratory (HPCT Limited)**

Calibrated by:   
 Technical Officer (Wong Shing Kwai)

Approved by:   
 Project Manager (Henry Leung)

**Certificate of Calibration**

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler


Description: Digital Dust Indicator Date of Calibration 31-Jul-23  
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 30-Sep-23  
 Model No.: LD-5R  
 Serial No.: 8Y2373  
 Equipment No.: SA-01-05 Sensitivity 0.001 mg/m3  
 High Volume Sampler No.: A-01-03 Before Sensitivity Adjustment 657  
 Tisch Calibration Orifice No.: 3864 After Sensitivity Adjustment 657

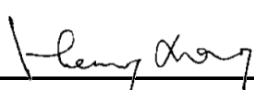
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration (µg/m <sup>3</sup> ) X-axis	Mass concentration (µg/m <sup>3</sup> ) Y-axis
1	74.0	135.0
2	65.0	116.0
3	54.0	98.0
<b>Average</b>	<b>64.3</b>	<b>116.3</b>
<b>By Linear Regression of Y on X</b> Slope , mw = <u>1.8422</u> Intercept, bw = <u>-2.1811</u> Correlation coefficient* = <u>0.9973</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler (µg/m <sup>3</sup> )		116.3
Particulate Concentration by Dust Meter (µg/m <sup>3</sup> )		64.3
Measuring time, (min)		60.0
Set Correlation Factor , SCF		
SCF = [ K=High Volume Sampler / Dust Meter, (µg/m <sup>3</sup> ) ]		<u>1.8</u>

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

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

Calibrated by:   
 Technical Officer (Wong Shing Kwai)

Approved by:   
 Project Manager (Henry Leung)

**Certificate of Calibration**

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler


Description: Digital Dust Indicator Date of Calibration 31-Jul-23  
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 30-Sep-23  
 Model No.: LD-5R  
 Serial No.: 972777  
 Equipment No.: SA-01-06 Sensitivity 0.001 mg/m3  
 High Volume Sampler No.: A-01-03 Before Sensitivity Adjustment 645  
 Tisch Calibration Orifice No.: 3864 After Sensitivity Adjustment 645

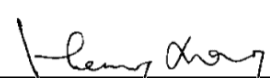
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration ( $\mu\text{g}/\text{m}^3$ ) X-axis	Mass concentration ( $\mu\text{g}/\text{m}^3$ ) Y-axis
1	71.0	137.0
2	63.0	118.0
3	51.0	98.0
<b>Average</b>	<b>61.7</b>	<b>117.7</b>
<b>By Linear Regression of Y on X</b> Slope , mw = <u>1.9276</u> Intercept, bw = <u>-1.2039</u> Correlation coefficient* = <u>0.9950</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler ( $\mu\text{g}/\text{m}^3$ )		117.7
Particulate Concentration by Dust Meter ( $\mu\text{g}/\text{m}^3$ )		61.7
Measuring time, (min)		60.0
Set Correlation Factor , SCF		
SCF = [ K=High Volume Sampler / Dust Meter, ( $\mu\text{g}/\text{m}^3$ ) ]		<u>1.9</u>

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

**Those filter papers are weighted by HOKLAS laboratory (HPCT Limited)**

Calibrated by:   
 Technical Officer (Wong Shing Kwai)

Approved by:   
 Project Manager (Henry Leung)



**Certificate of Calibration**

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler


Description: Digital Dust Indicator Date of Calibration 31-Jul-23  
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 30-Sep-23  
 Model No.: LD-5R  
 Serial No.: 972778  
 Equipment No.: SA-01-07 Sensitivity 0.001 mg/m3  
 High Volume Sampler No.: A-01-03 Before Sensitivity Adjustment 735 CPM  
 Tisch Calibration Orifice No.: 3864 After Sensitivity Adjustment 735 CPM

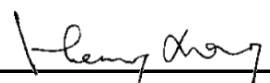
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration (µg/m <sup>3</sup> ) X-axis	Mass concentration (µg/m <sup>3</sup> ) Y-axis
1	70.0	137.0
2	61.0	119.0
3	50.0	98.0
<b>Average</b>	<b>60.3</b>	<b>118.0</b>
<b>By Linear Regression of Y on X</b> Slope , mw = <u>1.9485</u> Intercept, bw = <u>0.4402</u> Correlation coefficient* = <u>0.9999</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler (µg/m <sup>3</sup> )	118.0	
Particulate Concentration by Dust Meter (µg/m <sup>3</sup> )	60.3	
Measuring time, (min)	60.0	
Set Correlation Factor , SCF		
SCF = [ K=High Volume Sampler / Dust Meter, (µg/m <sup>3</sup> ) ]	<u>2.0</u>	

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

**Those filter papers are weighted by HOKLAS laboratory (HPCT Limited)**

Calibrated by:   
 Technical Officer (Wong Shing Kwai)

Approved by:   
 Project Manager (Henry Leung)

**Certificate of Calibration**

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler


Description: Digital Dust Indicator Date of Calibration 31-Jul-23  
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 30-Sep-23  
 Model No.: LD-5R  
 Serial No.: 972779  
 Equipment No.: SA-01-08 Sensitivity 0.001 mg/m3  
 High Volume Sampler No.: A-01-03 Before Sensitivity Adjustment 744 CPM  
 Tisch Calibration Orifice No.: 3864 After Sensitivity Adjustment 744 CPM

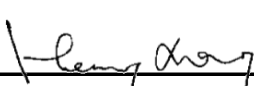
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration (µg/m <sup>3</sup> ) X-axis	Mass concentration (µg/m <sup>3</sup> ) Y-axis
1	71.0	138.0
2	60.0	118.0
3	52.0	98.0
<b>Average</b>	<b>61.0</b>	<b>118.0</b>
<b>By Linear Regression of Y on X</b> Slope , mw = <u>2.0879</u> Intercept, bw = <u>-9.3626</u> Correlation coefficient* = <u>0.9959</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler (µg/m <sup>3</sup> )		118.0
Particulate Concentration by Dust Meter (µg/m <sup>3</sup> )		61.0
Measuring time, (min)		60.0
Set Correlation Factor , SCF SCF = [ K=High Volume Sampler / Dust Meter, (µg/m <sup>3</sup> ) ] <u>1.9</u>		

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

**Those filter papers are weighted by HOKLAS laboratory (HPCT Limited)**

Calibrated by:   
 Technical Officer (Wong Shing Kwai)

Approved by:   
 Project Manager (Henry Leung)

**Certificate of Calibration**

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler


Description: Digital Dust Indicator Date of Calibration 31-Jul-23  
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 30-Sep-23  
 Model No.: LD-5R  
 Serial No.: 972780  
 Equipment No.: SA-01-09 Sensitivity 0.001 mg/m3  
 High Volume Sampler No.: A-01-03 Before Sensitivity Adjustment 739 CPM  
 Tisch Calibration Orifice No.: 3864 After Sensitivity Adjustment 739 CPM

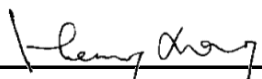
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration (µg/m <sup>3</sup> ) X-axis	Mass concentration (µg/m <sup>3</sup> ) Y-axis
1	73.0	140.0
2	63.0	120.0
3	52.0	99.0
<b>Average</b>	<b>62.7</b>	<b>119.7</b>
<b>By Linear Regression of Y on X</b> Slope , mw = <u>1.9517</u> Intercept, bw = <u>-2.6375</u> Correlation coefficient* = <u>0.9999</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler (µg/m <sup>3</sup> )		119.7
Particulate Concentration by Dust Meter (µg/m <sup>3</sup> )		62.7
Measuring time, (min)		60.0
Set Correlation Factor , SCF		
SCF = [ K=High Volume Sampler / Dust Meter, (µg/m <sup>3</sup> ) ]		<u>1.9</u>

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

**Those filter papers are weighted by HOKLAS laboratory (HPCT Limited)**

Calibrated by:   
 Technical Officer (Wong Shing Kwai)

Approved by:   
 Project Manager (Henry Leung)

**Certificate of Calibration**

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler


Description: Digital Dust Indicator Date of Calibration 31-Jul-23  
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 30-Sep-23  
 Model No.: LD-5R  
 Serial No.: 972781  
 Equipment No.: SA-01-10 Sensitivity 0.001 mg/m3  
 High Volume Sampler No.: A-01-03 Before Sensitivity Adjustment 734 CPM  
 Tisch Calibration Orifice No.: 3864 After Sensitivity Adjustment 734 CPM

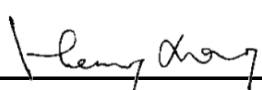
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration (µg/m <sup>3</sup> ) X-axis	Mass concentration (µg/m <sup>3</sup> ) Y-axis
1	80.5	132.0
2	70.0	114.0
3	59.0	97.0
<b>Average</b>	<b>69.8</b>	<b>114.3</b>
<b>By Linear Regression of Y on X</b> Slope , mw = <u>1.6273</u> Intercept, bw = <u>0.6968</u> Correlation coefficient* = <u>0.9996</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler (µg/m <sup>3</sup> )		114.3
Particulate Concentration by Dust Meter (µg/m <sup>3</sup> )		69.8
Measuring time, (min)		60.0
Set Correlation Factor , SCF		
SCF = [ K=High Volume Sampler / Dust Meter, (µg/m <sup>3</sup> ) ]		<u>1.6</u>

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

**Those filter papers are weighted by HOKLAS laboratory (HPCT Limited)**

Calibrated by:   
 Technical Officer (Wong Shing Kwai)

Approved by:   
 Project Manager (Henry Leung)



# Certificate of Calibration

Calibration Certification Information			
Cal. Date: January 16, 2023	Rootsmer S/N: 438320	Ta: 293	°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	1.4440	3.2	2.00
2	3	4	1	1.0220	6.4	4.00
3	5	6	1	0.9100	8.0	5.00
4	7	8	1	0.8710	8.8	5.50
5	9	10	1	0.7210	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)
0.9981	0.6912	1.4159	0.9957	0.6896	0.8845
0.9938	0.9724	2.0024	0.9915	0.9701	1.2509
0.9917	1.0898	2.2388	0.9893	1.0872	1.3985
0.9906	1.1373	2.3480	0.9883	1.1346	1.4668
0.9853	1.3665	2.8318	0.9829	1.3633	1.7690
<b>QSTD</b>	m=	<b>2.09452</b>	<b>QA</b>	m=	<b>1.31155</b>
	b=	<b>-0.03493</b>		b=	<b>-0.02182</b>
	r=	<b>0.99995</b>		r=	<b>0.99995</b>

Calculations	
Vstd= $\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$	Va= $\Delta Vol((Pa-\Delta P)/Pa)$
Qstd= $Vstd/\Delta Time$	Qa= $Va/\Delta Time$
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: Yau Lai Estate, Bik Lai House  
 Manufacturer: Davis Instruments  
 Model No.: Davis7440  
 Serial No.: MC01010A44  
 Equipment No.: SA-03-04  
 Date of Calibration: 18-Aug-2023  
 Next Due Date: 18-Feb-2024

### 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
1.5	1.5	0.0
2.5	2.4	0.1
4.0	3.9	0.1

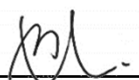
### 2. Performance check of Wind Direction

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

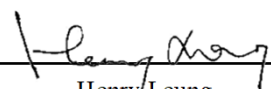
### Test Specification:

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

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. : 00370  
Application No. : HP00242

Issue Date : 02 May 2023

### 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.: : SN-01-01

Manufacturer: : SVANTEK

Other information :

Model No.	SVAN 979
Serial No.	27189
Microphone No.	25202

Date Received : 02 May 2023

Test Period : 02 May 2023 to 02 May 2023

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.

Rm 1904, Technology Park  
18 On Lai Street, Shatin  
NT, Hong Kong  
Tel: +852 3841 4388 Website: <https://www.hpct.com.hk>



Report No. : 00370

Issue Date : 02 May 2023

Application No. : HP00242

### 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.

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



Report No. : 00319  
Application No. : HP00222

Issue Date : 06 Jan 2023

### 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-08-07

Manufacturer: : SVANTEK

Other information :

Model No.	SVAN 957
Serial No.	21455
Microphone No.	17204

Date Received : 06 Jan 2023

Test Period : 06 Jan 2023 to 06 Jan 2023

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**

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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. : 00319

Issue Date : 06 Jan 2023

Application No. : HP00222

### 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	95.0	± 1.0	± 1.5
114.0	114.4	+ 0.4	± 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  
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NT, Hong Kong  
Tel: +852 3841 4388 Website: <https://www.hpct.com.hk>



Report No. : 00333  
Application No. : HP00212

Issue Date : 20 Jan 2023

### 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-12-02

Manufacturer: : BSWA Technology

Other information :

Model No.	BSWA 308
Serial No.	570187
Microphone No.	590079

Date Received : 18 Jan 2023

Test Period : 20 Jan 2023 to 20 Jan 2023

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**

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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. : 00333

Issue Date : 20 Jan 2023

Application No. : HP00212

### 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	94.0	± 0.0	± 1.5
114.0	114.2	+ 0.2	± 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  
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Tel: +852 3841 4388 Website: <https://www.hpct.com.hk>



Report No. : 00361  
Application No. : HP00236

Issue Date : 30 Mar 2023

### 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 : 27 Mar 2023

Test Period : 28 Mar 2023 to 28 Mar 2023

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**

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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. : 00361

Issue Date : 30 Mar 2023

Application No. : HP00236

### 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	114.3	+ 0.3	± 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. : 00364  
Application No. : HP00240

Issue Date : 03 Apr 2023

### 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-12-05

Manufacturer: : BSWA Technology

Other information :

Model No.	BSWA 308
Serial No.	580287
Microphone No.	570610

Date Received : 03 Apr 2023

Test Period : 03 Apr 2023 to 03 Apr 2023

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**

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Lee Wai Kit  
Laboratory Manager

## High Precision Chemical Testing Ltd.

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



Report No. : 00364  
Application No. : HP00240

Issue Date : 03 Apr 2023

### 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	114.2	+ 0.2	± 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  
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NT, Hong Kong  
Tel: +852 3841 4388 Website: <https://www.hpct.com.hk>



Report No. : 00288  
Application No. : HP00176

Issue Date : 10 Nov 2022

**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-13-03

Manufacturer: : SOUNDTEK

Other information : Model No.	ST-120
Serial No.	181001637

Date Received : 10 Nov 2022

Test Period : 10 Nov 2022 to 10 Nov 2022

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. : 00288

Issue Date : 10 Nov 2022

Application No. : HP00176

### 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	BSWA Technology
Model No.	BSWA 308
Serial No.	570183
Microphone No.	570605
Equipment No.	N-12-01

Test Result :

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB
94.0	94.1	+ 0.1	± 0.3
114.0	114.2	+ 0.2	± 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 -

## 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. : 00389  
Application No. : HP00262

Issue Date : 20 Jul 2023

### 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-16-01

Manufacturer: : Hangzhou Aihua Instruments Co., Ltd.

Other information :

Model No.	AWA6021A
Serial No.	1023253

Date Received : 18 Jul 2023

Test Period : 19 Jul 2023 to 19 Jul 2023

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**

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

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. : 00389  
Application No. : HP00262

Issue Date : 20 Jul 2023

### 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	BSWA Technology
	Model No.	BSWA 308
	Serial No.	570183
	Microphone No.	570605
	Equipment No.	N-12-01

Test Result :

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB
94.0	94.2	+ 0.2	± 0.3
114.0	114.2	+ 0.2	± 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 -