

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station: <u>Sheung Wun Yiu (AM1A)</u>	Operator: <u>Gary Choi</u>
Cal. Date: <u>16-Nov-13</u>	Next Due Date: <u>16-Jan-14</u>
Equipment No.: <u>A-001-53T</u>	Serial No.: <u>10216</u>

Ambient Condition			
Temperature, Ta (K)	297.4	Pressure, Pa (mmHg)	763.4

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	1.99238	Intercept, bc	-0.00351
Last Calibration Date:	6-Dec-12	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$ $Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			
Next Calibration Date:	6-Dec-13				

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	8.8	2.98	1.50	46.0	46.15
13	6.2	2.50	1.26	38.0	38.12
10	4.4	2.10	1.06	32.0	32.10
7	3.5	1.88	0.94	27.0	27.09
5	2.3	1.52	0.77	20.0	20.06

By Linear Regression of Y on X

Slope, mw = 35.4352 Intercept, bw = -6.4026

Correlation Coefficient* = 0.9959

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m³/min

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

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]^{1/2} = 39.53

Remarks: _____

QC Reviewer: K. M. SHEK

Signature: [Signature]

Date: 18 Nov 13

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Sheung Wun Yiu (AM1A)	Operator:	Gary Choi
Cal. Date:	15-Jan-14	Next Due Date:	15-Mar-14
Equipment No.:	A-001-53T	Serial No.	10216

Ambient Condition			
Temperature, Ta (K)	289	Pressure, Pa (mmHg)	767.0

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	1.94727	Intercept, bc	0.02332
Last Calibration Date:	20-May-13	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$ $Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			
Next Calibration Date:	20-May-14				

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	8.9	3.04	1.55	46.0	46.93
13	6.0	2.50	1.27	37.0	37.74
10	4.4	2.14	1.09	31.0	31.62
7	3.6	1.94	0.98	28.0	28.56
5	2.1	1.48	0.75	22.0	22.44

By Linear Regression of Y on X

Slope, mw = 30.7427

Intercept, bw = -1.2068

Correlation Coefficient* = 0.9966

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take $Q_{std} = 1.30 \text{ m}^3/\text{min}$

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

$$mw \times Q_{std} + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]^{1/2}= 37.99

Remarks: _____

QC Reviewer: WIS CHAN

Signature: 

Date: 16/1/14

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station: <u>Shan Tong New Village (AM2)</u>	Operator: <u>Choi Wing Ho</u>
Cal. Date: <u>22-Dec-13</u>	Next Due Date: <u>22-Feb-14</u>
Equipment No.: <u>A-001-29T</u>	Serial No.: <u>10202</u>

Ambient Condition			
Temperature, Ta (K)	289	Pressure, Pa (mmHg)	756.9

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	1.94727	Intercept, bc	0.02332
Last Calibration Date:	20-May-13	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$ $Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			
Next Calibration Date:	20-May-14				

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	9.0	3.04	1.55	47.0	47.63
13	6.5	2.58	1.31	40.0	40.54
10	5.3	2.33	1.19	35.0	35.47
7	3.6	1.92	0.98	29.0	29.39
5	2.6	1.63	0.83	22.0	22.29

By Linear Regression of Y on X

Slope, mw = 34.4706 Intercept, bw = -5.2867

Correlation Coefficient* = 0.9935

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation
From the TSP Field Calibration Curve, take Qstd = 1.30m³/min From the Regression Equation, the "Y" value according to $mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$ Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]^{1/2} = <u>39.00</u>

Remarks: _____

QC Reviewer: Y.T. Lam Signature: [Signature] Date: 23-12-13

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station: <u>Riverain Bayside (AM3)</u>	Operator: <u>Choi Wing Ho</u>
Cal. Date: <u>22-Dec-13</u>	Next Due Date: <u>22-Feb-14</u>
Equipment No.: <u>A-001-69T</u>	Serial No.: <u>716</u>

Ambient Condition			
Temperature, Ta (K)	289	Pressure, Pa (mmHg)	756.9

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	1.94727	Intercept, bc	0.02332
Last Calibration Date:	20-May-13	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	20-May-14	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	8.8	3.01	1.53	47.0	47.63
13	7.3	2.74	1.39	43.0	43.58
10	5.6	2.40	1.22	35.0	35.47
7	3.9	2.00	1.02	26.0	26.35
5	2.9	1.73	0.87	22.0	22.29

By Linear Regression of Y on X

Slope, mw = 40.2648 Intercept, bw = -13.5403

Correlation Coefficient* = 0.9943

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation	
From the TSP Field Calibration Curve, take Qstd = 1.30m ³ /min	
From the Regression Equation, the "Y" value according to	
$mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$	
Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)] ^{1/2} =	<u>38.29</u>

Remarks: _____

QC Reviewer: YT Leung Signature:  Date: 23-12-13

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station: 168 Shek Kwu Lung Village (AM4A)	Operator: Gary Choi
Cal. Date: 16-Nov-13	Next Due Date: 16-Jan-14
Equipment No.: A-001-70T	Serial No: 10273

Ambient Condition			
Temperature, Ta (K)	297.4	Pressure, Pa (mmHg)	763.4

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	1.99238	Intercept, bc	-0.00351
Last Calibration Date:	6-Dec-12	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$ $Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			
Next Calibration Date:	6-Dec-13				

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	8.9	2.99	1.50	47.0	47.15
13	7.5	2.75	1.38	42.0	42.14
10	5.1	2.27	1.14	34.0	34.11
7	3.5	1.88	0.94	28.0	28.09
5	2.4	1.55	0.78	22.0	22.07

By Linear Regression of Y on X

Slope, mw = 34.0386 Intercept, bw = -4.4274

Correlation Coefficient* = 0.9986

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m³/min

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

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]^{1/2} = 39.69

Remarks:

QC Reviewer: K. H. SHEK

Signature: Mike

Date: 18 Nov 13

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station: 168 Shek Kwu Lung Village (AM4A) Operator: Gary Choi
 Cal. Date: 15-Jan-14 Next Due Date: 15-Mar-14
 Equipment No.: A-001-70T Serial No: 10273

Ambient Condition			
Temperature, Ta (K)	289	Pressure, Pa (mmHg)	767.0

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	1.94727	Intercept, bc	0.02332
Last Calibration Date:	20-May-13	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$ $Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			
Next Calibration Date:	20-May-14				

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	9.0	3.06	1.56	46.0	46.93
13	7.4	2.78	1.41	42.0	42.84
10	5.0	2.28	1.16	35.0	35.70
7	3.3	1.85	0.94	27.0	27.54
5	2.5	1.61	0.82	23.0	23.46

By Linear Regression of Y on X

Slope, mw = 31.7150

Intercept, bw = -2.0528

Correlation Coefficient* = 0.9964

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m³/min

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

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]^{1/2} = 38.40

Remarks:

QC Reviewer:

WS CHAN

Signature:

[Signature]

Date:

16/1/14



TISCH ENVIRONMENTAL, INC.
 145 SOUTH MIAMI AVE.
 VILLAGE OF CLEVELAND, OH 45002
 513.467.9000
 877.263.7610 TOLL FREE
 513.467.9009 FAX
 WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 20, 2013 Roots-meter S/N 0438320 Ta (K) - 297
 Operator Tisch Orifice I.D. - 0988 Pa (mm) - 751.84

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER	ORFICE
					DIFF Hg (mm)	DIFF H2O (in.)
1	NA	NA	1.00	1.3900	3.2	2.00
2	NA	NA	1.00	0.9720	6.4	4.00
3	NA	NA	1.00	0.8670	7.9	5.00
4	NA	NA	1.00	0.8270	8.7	5.50
5	NA	NA	1.00	0.6800	12.6	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9884	0.7110	1.4090		0.9957	0.7163	0.8889
0.9842	1.0125	1.9926		0.9915	1.0201	1.2570
0.9821	1.1327	2.2278		0.9894	1.1412	1.4054
0.9811	1.1863	2.3365		0.9884	1.1952	1.4740
0.9759	1.4352	2.8179		0.9832	1.4459	1.7777
Qstd slope (m) = 1.94727				Qa slope (m) = 1.21935		
intercept (b) = 0.02332				intercept (b) = 0.01471		
coefficient (r) = 0.99998				coefficient (r) = 0.99998		
y axis = SQRT[H2O(Pa/760) (298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol [(Pa-Diff. Hg)/760] (298/Ta)
 Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
 Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{ [SQRT(H2O(Pa/760) (298/Ta))] - b}
 Qa = 1/m{ [SQRT H2O(Ta/Pa)] - b}

EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor
 Manufacturer/Brand: SIBATA
 Model No.: LD-3
 Equipment No.: A.005.07a
 Sensitivity Adjustment Scale Setting: 557 CPM
 Operator: Mike Shek (MSKM)

Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®
 Venue: Cyberport (Pui Ying Secondary School)
 Model No.: Series 1400AB
 Serial No: Control: 140AB219899803
 Sensor: 1200C143659803 K_o: 12500
 Last Calibration Date*: 18 May 2013

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 557 CPM
 Sensitivity Adjustment Scale Setting (After Calibration): 557 CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
			Temp (°C)	R.H. (%)			
1	18-05-13	12:30 - 13:30	28.1	78	0.04714	1887	31.45
2	18-05-13	13:30 - 14:30	28.1	78	0.04932	1970	32.83
3	18-05-13	14:30 - 15:30	28.2	77	0.05156	2056	34.27
4	18-05-13	15:30 - 16:30	28.1	78	0.05083	2026	33.77

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
 2. Total Count was logged by Laser Dust Monitor
 3. Count/minute was calculated by (Total Count/60)

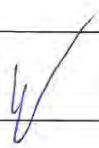
By Linear Regression of Y or X

Slope (K-factor): 0.0015
 Correlation coefficient: 0.9978

Validity of Calibration Record: 17 May 2014

Remarks:

QC Reviewer: YW Fung

Signature: 

Date: 20 May 2013

EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor
Manufacturer/Brand: SIBATA
Model No.: LD-3
Equipment No.: A.005.08a
Sensitivity Adjustment Scale Setting: 702 CPM

Operator: Mike Shek (MSKM)

Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®
Venue: Cyberport (Pui Ying Secondary School)
Model No.: Series 1400AB
Serial No: Control: 140AB219899803
Sensor: 1200C143659803 K₀: 12500
Last Calibration Date*: 18 May 2013

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 702 CPM
Sensitivity Adjustment Scale Setting (After Calibration): 702 CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
			Temp (°C)	R.H. (%)			
1	18-05-13	12:30 - 13:30	28.1	78	0.04714	1764	29.40
2	18-05-13	13:30 - 14:30	28.1	78	0.04932	1846	30.77
3	18-05-13	14:30 - 15:30	28.2	77	0.05156	1935	32.25
4	18-05-13	15:30 - 16:30	28.1	78	0.05083	1899	31.65

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
2. Total Count was logged by Laser Dust Monitor
3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X

Slope (K-factor): 0.0016
Correlation coefficient: 0.9976

Validity of Calibration Record: 17 May 2014

Remarks:

QC Reviewer: YW Fung Signature:  Date: 20 May 2013

EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor
 Manufacturer/Brand: SIBATA
 Model No.: LD-3
 Equipment No.: A.005.09a
 Sensitivity Adjustment Scale Setting: 797 CPM
 Operator: Mike Shek (MSKM)

Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®
 Venue: Cyberport (Pui Ying Secondary School)
 Model No.: Series 1400AB
 Serial No: Control: 140AB219899803
 Sensor: 1200C143659803 K₀: 12500
 Last Calibration Date*: 18 May 2013

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 797 CPM
 Sensitivity Adjustment Scale Setting (After Calibration): 797 CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
			Temp (°C)	R.H. (%)			
1	18-05-13	12:30 - 13:30	28.1	78	0.04714	1885	31.42
2	18-05-13	13:30 - 14:30	28.1	78	0.04932	1965	32.75
3	18-05-13	14:30 - 15:30	28.2	77	0.05156	2059	34.32
4	18-05-13	15:30 - 16:30	28.1	78	0.05083	2024	33.73

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
 2. Total Count was logged by Laser Dust Monitor
 3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X

Slope (K-factor): 0.0015
 Correlation coefficient: 0.9973

Validity of Calibration Record: 17 May 2014

Remarks:

QC Reviewer: YW Fung Signature:  Date: 20 May 2013

EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor
Manufacturer/Brand: SIBATA
Model No.: LD-3
Equipment No.: A.005.10a
Sensitivity Adjustment Scale Setting: 753 CPM

Operator: Mike Shek (MSKM)

Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®
Venue: Cyberport (Pui Ying Secondary School)
Model No.: Series 1400AB
Serial No: Control: 140AB219899803
Sensor: 1200C143659803 K₀: 12500
Last Calibration Date*: 18 May 2013

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 753 CPM
Sensitivity Adjustment Scale Setting (After Calibration): 753 CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
			Temp (°C)	R.H. (%)			
1	18-05-13	12:30 - 13:30	28.1	78	0.04714	1886	31.43
2	18-05-13	13:30 - 14:30	28.1	78	0.04932	1968	32.80
3	18-05-13	14:30 - 15:30	28.2	77	0.05156	2061	34.35
4	18-05-13	15:30 - 16:30	28.1	78	0.05083	2026	33.77

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
2. Total Count was logged by Laser Dust Monitor
3. Count/minute was calculated by (Total Count/60)

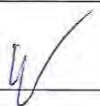
By Linear Regression of Y or X

Slope (K-factor): 0.0015
Correlation coefficient: 0.9983

Validity of Calibration Record: 17 May 2014

Remarks:

QC Reviewer: YW Fung

Signature: 

Date: 20 May 2013

EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor
 Manufacturer/Brand: SIBATA
 Model No.: LD-3
 Equipment No.: A.005.11a
 Sensitivity Adjustment Scale Setting: 799 CPM
 Operator: Mike Shek (MSKM)

Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®
 Venue: Cyberport (Pui Ying Secondary School)
 Model No.: Series 1400AB
 Serial No: Control: 140AB219899803
 Sensor: 1200C143659803 K₀: 12500
 Last Calibration Date*: 18 May 2013

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 799 CPM
 Sensitivity Adjustment Scale Setting (After Calibration): 799 CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
			Temp (°C)	R.H. (%)			
1	18-05-13	12:15 - 13:15	28.1	78	0.04685	1871	31.18
2	18-05-13	13:15 - 14:15	28.1	78	0.04941	1979	32.98
3	18-05-13	14:15 - 15:15	28.2	77	0.05127	2055	34.25
4	18-05-13	15:15 - 16:15	28.1	78	0.05060	2021	33.68

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
 2. Total Count was logged by Laser Dust Monitor
 3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X

Slope (K-factor): 0.0015
 Correlation coefficient: 0.9976

Validity of Calibration Record: 17 May 2014

Remarks:

QC Reviewer: YW Fung

Signature: 

Date: 20 May 2013

EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor
 Manufacturer/Brand: SIBATA
 Model No.: LD-3B
 Equipment No.: A.005.13a
 Sensitivity Adjustment Scale Setting: 643 CPM
 Operator: Mike Shek (MSKM)

Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®
 Venue: Cyberport (Pui Ying Secondary School)
 Model No.: Series 1400AB
 Serial No: Control: 140AB219899803
 Sensor: 1200C143659803 K₀: 12500
 Last Calibration Date*: 18 May 2013

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 643 CPM
 Sensitivity Adjustment Scale Setting (After Calibration): 643 CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
			Temp (°C)	R.H. (%)			
1	18-05-13	12:15 - 13:15	28.1	78	0.04685	1867	31.12
2	18-05-13	13:15 - 14:15	28.1	78	0.04941	1975	32.92
3	18-05-13	14:15 - 15:15	28.2	77	0.05127	2048	34.13
4	18-05-13	15:15 - 16:15	28.1	78	0.05060	2017	33.62

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
 2. Total Count was logged by Laser Dust Monitor
 3. Count/minute was calculated by (Total Count/60)

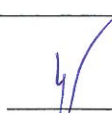
By Linear Regression of Y or X

Slope (K-factor): 0.0015
 Correlation coefficient: 0.9986

Validity of Calibration Record: 17 May 2014

Remarks:

QC Reviewer: YW Fung

Signature: 

Date: 20 May 2013

EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor
 Manufacturer/Brand: SIBATA
 Model No.: LD-3B
 Equipment No.: A.005.16a
 Sensitivity Adjustment Scale Setting: 521 CPM
 Operator: Mike Shek (MSKM)

Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®
 Venue: Cyberport (Pui Ying Secondary School)
 Model No.: Series 1400AB
 Serial No: Control: 140AB219899803
 Sensor: 1200C143659803 K_o: 12500
 Last Calibration Date*: 18 May 2013

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 521 CPM
 Sensitivity Adjustment Scale Setting (After Calibration): 521 CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
			Temp (°C)	R.H. (%)			
1	27-07-13	11:00 - 12:00	27.3	75	0.04734	1893	31.55
2	27-07-13	12:00 - 13:00	27.3	75	0.04789	1915	31.92
3	27-07-13	13:00 - 14:00	27.4	74	0.04953	1976	32.93
4	27-07-13	14:00 - 15:00	27.4	75	0.04867	1949	32.48

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
 2. Total Count was logged by Laser Dust Monitor
 3. Count/minute was calculated by (Total Count/60)

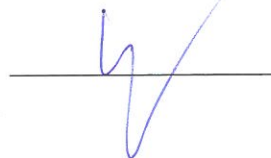
By Linear Regression of Y or X

Slope (K-factor): 0.0015
 Correlation coefficient: 0.9934

Validity of Calibration Record: 26 July 2014

Remarks:

QC Reviewer: YW Fung

Signature: 

Date: 29 July 2013



CERTIFICATE OF CALIBRATION

Certificate No.: 13CA1107 01-02

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: Rion Co., Ltd.
Type/Model No.: NC-73
Serial/Equipment No.: 10307223 / N.004.08
Adaptors used: -

Item submitted by

Customer: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 07-Nov-2013

Date of test: 08-Nov-2013

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	17-Apr-2014	SCL
Preamplifier	B&K 2673	2239857	16-Apr-2014	CEPREI
Measuring amplifier	B&K 2610	2346941	24-Apr-2014	CEPREI
Signal generator	DS 360	61227	15-Apr-2014	CEPREI
Digital multi-meter	34401A	US36087050	10-Dec-2013	CEPREI
Audio analyzer	8903B	GB41300350	15-Apr-2014	CEPREI
Universal counter	53132A	MY40003662	15-Apr-2014	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 60 ± 10 %
Air pressure: 1000 ± 10 hPa

Test specifications

- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on **page 2** of this certificate.

Approved Signatory:

Huang Jian Min/Feng Jun Qi

Date: 11-Nov-2013

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

Certificate No.: 13CA0325 01-03

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: Rion Co., Ltd.
Type/Model No.: NC-73
Serial/Equipment No.: 10186482 / N.004.09
Adaptors used: -

Item submitted by

Customer: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 25-Mar-2013

Date of test: 26-Mar-2013

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	29-May-2013	SCL
Preamplifier	B&K 2673	2239857	17-Dec-2013	CEPREI
Measuring amplifier	B&K 2610	2346941	17-Dec-2013	CEPREI
Signal generator	DS 360	61227	29-May-2013	CEPREI
Digital multi-meter	34401A	US36087050	10-Dec-2013	CEPREI
Audio analyzer	8903B	GB41300350	29-May-2013	CEPREI
Universal counter	53132A	MY40003662	29-May-2013	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 60 ± 10 %
Air pressure: 1000 ± 10 hPa

Test specifications

- 1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- 2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- 3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:

Huang Jian Min/Feng Jun Qi

Date: 26-Mar-2013

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

Certificate No.: 13CA1107 01-01

Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	, Microphone
Manufacturer:	Rion Co., Ltd.	, Rion Co., Ltd.
Type/Model No.:	NL-31	, UC-53A
Serial/Equipment No.:	00320528 / N.007.03A	, 90565
Adaptors used:	-	, -

Item submitted by

Customer Name: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 07-Nov-2013

Date of test: 08-Nov-2013

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	22-Jun-2014	CIGISMEC
Signal generator	DS 360	33873	15-Apr-2014	CEPREI
Signal generator	DS 360	61227	15-Apr-2014	CEPREI

Ambient conditions

Temperature: $22 \pm 1^\circ\text{C}$
Relative humidity: $60 \pm 10\%$
Air pressure: $1000 \pm 10\text{ hPa}$

Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of $\pm 20\%$.
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsiveness of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:


Huang Jian Min/Feng Jun Qi

Date: 11-Nov-2013

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.

G/F, 9/F, 12/F, 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
香港黃竹坑道37號利達中心地下, 9樓, 12樓, 13樓及20樓
E-mail: smec@cigismec.com Website: www.cigismec.com

Tel : (852) 2873 6860
Fax : (852) 2555 7533



CERTIFICATE OF CALIBRATION

Certificate No.: 13CA0325 01-01

Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone
Manufacturer:	B & K	B & K
Type/Model No.:	2238	4188
Serial/Equipment No.:	2285692 1609.04	2250420
Adaptors used:	-	-

Item submitted by

Customer Name: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 25-Mar-2013

Date of test: 26-Mar-2013

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	22-Jun-2013	CIGISMEC
Signal generator	DS 360	33873	29-May-2013	CEPREI
Signal generator	DS 360	61227	29-May-2013	CEPREI

Ambient conditions

Temperature: $22 \pm 1^\circ\text{C}$
Relative humidity: $60 \pm 10\%$
Air pressure: $1000 \pm 10\text{ hPa}$

Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of $\pm 20\%$.
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure response of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:

Huang Jian Min/Feng Jun Qi

Date: 26-Mar-2013

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

Certificate No.: 13CA0305 01-01

Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	, Microphone
Manufacturer:	B & K	, B & K
Type/Model No.:	2250-L	, 4950
Serial/Equipment No.:	2681366 (N.O.II.OI)	, 2665582
Adaptors used:	-	, -

Item submitted by

Customer Name: AECOM ASIA CO LIMITED
Address of Customer: -
Request No.: -
Date of receipt: 05-Mar-2013

Date of test: 05-Mar-2013

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-May-2013	CIGISMEC
Signal generator	DS 360	33873	29-May-2013	CEPREI
Signal generator	DS 360	61227	29-May-2013	CEPREI

Ambient conditions

Temperature: 21 ± 1 °C
Relative humidity: 60 ± 10 %
Air pressure: 1000 ± 10 hPa

Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of $\pm 20\%$.
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:

Huang Jian Min/Feng Jun Qi

Date: 05-Mar-2013

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.