

AECOM Asia Company Limited

TSP - Total Suspended Particulates Sampler Field Calibration Report

Station Kwun Tong Government Secondary School (ID1A)

Operator: Leung Yiu Ting

Date: 27-Oct-13

Next Due Date: 27-Dec-13

Pump No.: 763

Verified Against: O.T.S. -- 0988

Equipment No.: A-001-64T

Expiration Date: 20-May-14

Ambient Condition				
Temperature, Ta	302	Kelvin	Pressure, Pa	756.9 mmHg

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

Calibration of TSP Sampler					
Calibration Point	H in. of water	[H x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X - axis	W in. of oil	[ΔW x (Pa/760) x (298/Ta)] ^{1/2} Y-axis
1	9.2	3.01	1.53	5.8	2.39
2	8.5	2.89	1.47	5.0	2.22
3	6.2	2.47	1.26	3.4	1.83
4	4	1.98	1.00	2.3	1.50
5	2.5	1.57	0.79	1.4	1.17

By Linear Regression of Y on X

Slope, mw = 1.5957

Intercept, bw = -0.1088

Correlation Coefficient* = 0.9954

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.21 m³/min (43 CFM)

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

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

Therefore, Set Point W = $(m \times Qstd + b)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.38

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

Remarks: _____

QC Reviewer: YT Leung

Signature: 

Date: 27-10-13

AECOM Asia Company Limited

TSP - Total Suspended Particulates Sampler Field Calibration Report

Station On Yat House (ID2)

Date: 27-Oct-13

Pump No.: 1654

Equipment No.: A-001-61T

Operator: Leung Yiu Ting

Next Due Date: 27-Dec-13

Verified Against: O.T.S. -- 0988

Expiration Date: 20-May-14

Ambient Condition				
Temperature, Ta	302	Kelvin	Pressure, Pa	756.9 mmHg

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

Calibration of TSP Sampler					
Calibration Point	H in. of water	$[H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X - axis	W in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	9.0	2.97	1.51	5.9	2.41
2	7.0	2.62	1.33	4.0	1.98
3	5.2	2.26	1.15	3.0	1.72
4	4.1	2.01	1.02	2.3	1.50
5	2.6	1.60	0.81	1.3	1.13

By Linear Regression of Y on X

Slope, mw = 1.7799

Intercept, bw =

-0.3238

Correlation Coefficient* = 0.9966

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.21 m³/min (43 CFM)

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

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

Therefore, Set Point W = $(m \times Qstd + b)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.41

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

Remarks:

QC Reviewer: YI Lau

Signature: _____

Date: 27-10-13

AECOM Asia Company Limited

TSP - Total Suspended Particulates Sampler Field Calibration Report

Station Sau Nga House (ID3)
 Date: 27-Oct-13
 Pump No.: 1272
 Equipment No.: A-001-40T

Operator: Leung Yiu Ting
 Next Due Date: 27-Dec-13
 Verified Against: O.T.S. -- 0988
 Expiration Date: 20-May-14

Ambient Condition			
Temperature, Ta	302	Kelvin	Pressure, Pa
			756.9 mmHg

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

Calibration of TSP Sampler					
Calibration Point	H in. of water	$[H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X - axis	W in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	9.1	2.99	1.52	6.4	2.51
2	7.0	2.62	1.33	4.5	2.10
3	5.4	2.30	1.17	3.5	1.85
4	4	1.98	1.00	2.3	1.50
5	3.0	1.72	0.87	1.5	1.21

By Linear Regression of Y on X
 Slope , mw = 1.9617 Intercept, bw = -0.4769
 Correlation Coefficient* = 0.9987

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.21 m³/min (43 CFM)
 From the Regression Equation, the "Y" value according to

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

Therefore, Set Point W = (m x Qstd + b)² x (760 / Pa) x (Ta / 298) = 3.66

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

Remarks: _____

QC Reviewer: YT Leung

Signature: 

Date: 27-10-13

AECOM Asia Company Limited

TSP - Total Suspended Particulates Sampler Field Calibration Report

Station Sau Ming Primary School (ID4)Operator: Leung Yiu TingDate: 20-Oct-13Next Due Date: 20-Dec-13Pump No.: 1275Verified Against: O.T.S. -- 0988Equipment No.: A-001-28TExpiration Date: 20-May-14

Ambient Condition

Temperature, Ta	302	Kelvin	Pressure, Pa	756.9	mmHg
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Orifice Transfer Standard Information

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

Calibration of TSP Sampler

Calibration Point	H in. of water	$[H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X - axis	W in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	9.5	3.06	1.56	6.0	2.43
2	7.4	2.70	1.37	4.5	2.10
3	6.3	2.49	1.27	3.3	1.80
4	3.8	1.93	0.98	2.1	1.44
5	2.5	1.57	0.79	1.4	1.17

By Linear Regression of Y on X

Slope, mw = 1.6195Intercept, bw = -0.1456Correlation Coefficient* = 0.9917

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.21 m³/min (43 CFM)

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

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

$$\text{Therefore, Set Point } W = (m \times Qstd + b)^2 \times (760 / Pa) \times (Ta / 298) = \underline{3.35}$$

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

Remarks: _____

QC Reviewer: YT Leung

Signature: _____

Date: 20-10-13

AECOM Asia Company Limited

TSP - Total Suspended Particulates Sampler Field Calibration Report

Station Sau Mau Ping Catholic Primary School (ID5)

Operator: Leung Yiu Ting

Date: 20-Oct-13

Next Due Date: 20-Dec-13

Pump No.: 10088

Verified Against: O.T.S. -- 0988

Equipment No.: A-001-13T

Expiration Date: 20-May-14

Ambient Condition				
Temperature, Ta	302	Kelvin	Pressure, Pa	756.9 mmHg

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

Calibration of TSP Sampler					
Calibration Point	H in. of water	[H x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X - axis	W in. of oil	[ΔW x (Pa/760) x (298/Ta)] ^{1/2} Y-axis
1	9.4	3.04	1.55	6.2	2.47
2	8.0	2.80	1.43	5.0	2.22
3	5.2	2.26	1.15	3.8	1.93
4	4.1	2.01	1.02	2.6	1.60
5	2.5	1.57	0.79	1.5	1.21

By Linear Regression of Y on X

Slope, mw = 1.6089

Intercept, bw =

-0.0254

Correlation Coefficient* = 0.9921

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.21 m³/min (43 CFM)

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

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

Therefore, Set Point W = $(m \times Q_{std} + b)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.76

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

Remarks:

QC Reviewer: Y T Leung

Signature: [Signature]

Date: 20-10-13

AECOM Asia Company Limited

TSP - Total Suspended Particulates Sampler Field Calibration Report

Station On Yat House (ID2)
Date: 24-Dec-13
Pump No.: 1654
Equipment No.: A-001-61T

Operator: Choi Wing Ho
Next Due Date: 24-Feb-14
Verified Against: O.T.S. -- 0988
Expiration Date: 20-May-14

Ambient Condition					
Temperature, Ta	289	Kelvin	Pressure, Pa	756.9	mmHg

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

Calibration of TSP Sampler					
Calibration Point	H in. of water	$[H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X - axis	W in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	8.9	3.02	1.54	6.1	2.50
2	6.9	2.66	1.35	4.1	2.05
3	5.4	2.35	1.19	3.0	1.76
4	4.1	2.05	1.04	2.3	1.54
5	2.7	1.67	0.85	1.3	1.16

By Linear Regression of Y on X

Slope , mw = 1.8928 Intercept, bw = -0.4580
Correlation Coefficient* = 0.9970

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.21 m³/min (43 CFM)

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

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

Therefore, Set Point W = $(m \times Qstd + b)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.27

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

Remarks: _____

QC Reviewer: Y. T. Leung

Signature: 

Date: 27-12-13

AECOM Asia Company Limited

TSP - Total Suspended Particulates Sampler Field Calibration Report

Station Sau Nga House (ID3)
Date: 24-Dec-13
Pump No.: 1272
Equipment No.: A-001-31T

Operator: Choi Wing Ho
Next Due Date: 24-Feb-14
Verified Against: O.T.S. -- 0988
Expiration Date: 20-May-14

Ambient Condition				
Temperature, Ta	289	Kelvin	Pressure, Pa	756.9 mmHg

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

Calibration of TSP Sampler					
Calibration Point	H in. of water	[H x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X - axis	W in. of oil	[ΔW x (Pa/760) x (298/Ta)] ^{1/2} Y-axis
1	8.9	3.02	1.54	6.4	2.56
2	7.0	2.68	1.36	4.4	2.13
3	5.6	2.40	1.22	3.5	1.90
4	4.3	2.10	1.07	2.6	1.63
5	3.3	1.84	0.93	1.6	1.28
By Linear Regression of Y on X					
Slope, mw = <u>2.0291</u>		Intercept, bw = <u>-0.5837</u>			
Correlation Coefficient* = <u>0.9974</u>					

Set Point Calculation
From the TSP Field Calibration Curve, take Qstd = 1.21 m ³ /min (43 CFM) From the Regression Equation, the "Y" value according to
$m \times Q_{std} + b = [W \times (Pa/760) \times (298/Ta)]^{1/2}$
Therefore, Set Point W = (m x Qstd + b) ² x (760 / Pa) x (Ta / 298) = <u>3.41</u>

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

Remarks: _____

QC Reviewer: YI Lang

Signature: 

Date: 27-12-13

AECOM Asia Company Limited

TSP - Total Suspended Particulates Sampler Field Calibration Report

Station Sau Ming Primary School (ID4) Operator: Shum Kam Yuen
 Date: 18-Dec-13 Next Due Date: 18-Feb-14
 Pump No.: 1275 Verified Against: O.T.S. -- 0988
 Equipment No.: A-001-28T Expiration Date: 20-May-14

Ambient Condition				
Temperature, Ta	289	Kelvin	Pressure, Pa	756.9 mmHg

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

Calibration of TSP Sampler					
Calibration Point	H in. of water	[H x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X - axis	W in. of oil	[ΔW x (Pa/760) x (298/Ta)] ^{1/2} Y-axis
1	9.1	3.06	1.56	6.1	2.50
2	7.6	2.79	1.42	4.8	2.22
3	6.0	2.48	1.26	3.7	1.95
4	4.6	2.17	1.10	3.0	1.76
5	3.3	1.84	0.93	2.0	1.43

By Linear Regression of Y on X

Slope, mw = 1.6440 Intercept, bw = -0.0895

Correlation Coefficient* = 0.9970

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.21 m³/min (43 CFM)
 From the Regression Equation, the "Y" value according to

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

Therefore, Set Point W = (m x Qstd + b)² x (760 / Pa) x (Ta / 298) = 3.51

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

Remarks: _____

QC Reviewer: YTL Signature: [Signature] Date: 12-13

AECOM Asia Company Limited

TSP - Total Suspended Particulates Sampler Field Calibration Report

 Station Sau Mau Ping Catholic Primary School (ID5)

 Operator: Shum Kam Yuen

 Date: 18-Dec-13

 Next Due Date: 18-Feb-14

 Pump No.: 10088

 Verified Against: O.T.S. -- 0988

 Equipment No.: A-001-13T

 Expiration Date: 20-May-14

Ambient Condition			
Temperature, Ta	289	Kelvin	Pressure, Pa
			756.9 mmHg

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

Calibration of TSP Sampler					
Calibration Point	H in. of water	[H x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X - axis	W in. of oil	[ΔW x (Pa/760) x (298/Ta)] ^{1/2} Y-axis
1	8.8	3.01	1.53	6.2	2.52
2	7.6	2.79	1.42	5.0	2.27
3	5.3	2.33	1.18	3.5	1.90
4	4	2.03	1.03	2.6	1.63
5	2.8	1.70	0.86	1.6	1.28

By Linear Regression of Y on X

 Slope, mw = 1.7950

 Intercept, bw = -0.2412

 Correlation Coefficient* = 0.9984
Set Point Calculation

 From the TSP Field Calibration Curve, take Qstd = 1.21 m³/min (43 CFM)

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

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

 Therefore, Set Point W = (m x Qstd + b)² x (760 / Pa) x (Ta / 298) = 3.63

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

 Remarks: _____

 QC Reviewer: YI Lang

 Signature: 

 Date: 27-12-13



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 Rootsometer 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 DIFF Hg (mm)	ORFICE 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 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): 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.005.14a
 Sensitivity Adjustment Scale Setting: 786 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): 786 CPM
 Sensitivity Adjustment Scale Setting (After Calibration): 786 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	2005	33.42
2	18-05-13	13:15 - 14:15	28.1	78	0.04941	2121	35.35
3	18-05-13	14:15 - 15:15	28.2	77	0.05127	2194	36.57
4	18-05-13	15:15 - 16:15	28.1	78	0.05060	2167	36.12

- 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): 0.0014
 Correlation coefficient: 0.9987

Validity of Calibration Record: 17 May 2014

Remarks:

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



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 1009.04 , 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 ± 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 ±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 responses 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.: 12CA1008 02 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	Rion Co., Ltd.	Rion Co., Ltd.	Rion Co., Ltd.
Type/Model No.:	NL-31	UC-53A	NH-19
Serial/Equipment No.:	00320528 / N 007.03A	90565	75883
Adaptors used:	-	-	-

Item submitted by

Customer Name: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 08-Oct-2012

Date of test: 08-Oct-2012

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 ± 1) °C
Relative humidity: (60 ± 10) %
Air pressure: (1000 ± 5) 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 ±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 responses 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: 08-Oct-2012

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-011.01)	,	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

- 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.
- 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 ±20%.
- 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: 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.



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

- 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: 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.