

ENSR ASIA (HK) LTD

TSP High Volume Sampler

Field Calibration Report

Station: Access Road to Po Shan Mansions (CA1) Operator: Shum Kam Yuen
 Cal. Date: 7-May-09 Next Due Date: 7-Jul-09
 Equipment No.: A.001.46T Serial No.: 10217

Ambient Condition			
Temperature, Ta (K)	302	Pressure, Pa (mmHg)	756.6

Orifice Transfer Standard Information					
Equipment No.:	843	Slope, mc	2.02158	Intercept, bc	-0.02524
Last Calibration Date:	4-Nov-08	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	4-Nov-09	$Qstd = \{ [DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc \} / mc$			

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	[DH x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X - axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	9.8	3.10	1.55	50.0	49.56
13	6.9	2.60	1.30	42.0	41.63
10	5.3	2.28	1.14	34.0	33.70
7	3.7	1.91	0.96	28.0	27.75
5	2.8	1.66	0.83	22.0	21.80

By Linear Regression of Y on X

Slope, mw = 38.8644 Intercept, bw = -10.0179

Correlation Coefficient* = 0.9945

*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} = 40.87

Remarks: _____

QC Reviewer: Joe Fu Signature: Joe Date: 8 May 09

ENSR ASIA (HK) LTD

TSP High Volume Sampler

Field Calibration Report

Station: Access Road to Po Shan Mansions (CA1) Operator: Shum Kam Yuen
 Cal. Date: 4-Jul-09 Next Due Date: 4-Sep-09
 Equipment No.: A.001.46T Serial No.: 10217

Ambient Condition			
Temperature, Ta (K)	302	Pressure, Pa (mmHg)	753.3

Orifice Transfer Standard Information					
Equipment No.:	843	Slope, mc	2.02158	Intercept, bc	-0.02524
Last Calibration Date:	4-Nov-08	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	4-Nov-09	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	[DH x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	10.0	3.13	1.56	52.0	51.43
13	7.1	2.64	1.32	42.0	41.54
10	5.2	2.26	1.13	34.0	33.62
7	3.8	1.93	0.97	28.0	27.69
5	2.7	1.63	0.82	22.0	21.76

By Linear Regression of Y on X

Slope, mw = 39.9193 Intercept, bw = -10.9874

Correlation Coefficient* = 0.9996

*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>41.36</u>

Remarks: _____

QC Reviewer: Joe Fu Signature: Joe Date: 6 Jul 09

ENSR ASIA (HK) LTD

TSP High Volume Sampler

Field Calibration Report

Station: Podium oh Hamilton Court (CA2) Operator: Shum Kam Yuen
 Cal. Date: 7-May-09 Next Due Date: 7-Jul-09
 Equipment No.: A.001.15T Serial No.: 10380

Ambient Condition			
Temperature, Ta (K)	302	Pressure, Pa (mmHg)	756.6

Orifice Transfer Standard Information					
Equipment No.:	843	Slope, mc	2.02158	Intercept, bc	-0.02524
Last Calibration Date:	4-Nov-08	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	4-Nov-09	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

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	10.0	3.13	1.56	48.0	47.57
13	7.7	2.75	1.37	40.0	39.65
10	5.7	2.37	1.18	34.0	33.70
7	4.0	1.98	0.99	28.0	27.75
5	2.8	1.66	0.83	20.0	19.82

By Linear Regression of Y on X

Slope, mw = 36.5574 Intercept, bw = -9.7663

Correlation Coefficient* = 0.9936

*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} = 38.10

Remarks: _____

QC Reviewer: Joe Fu

Signature: Joe

Date: 8 May 09

ENSR ASIA (HK) LTD

TSP High Volume Sampler

Field Calibration Report

Station: Podium oh Hamilton Court (CA2) Operator: Shum Kam Yuen
 Cal. Date: 4-Jul-09 Next Due Date: 4-Sep-09
 Equipment No.: A.001.15T Serial No.: 10380

Ambient Condition			
Temperature, Ta (K)	302	Pressure, Pa (mmHg)	753.3

Orifice Transfer Standard Information					
Equipment No.:	843	Slope, mc	2.02158	Intercept, bc	-0.02524
Last Calibration Date:	4-Nov-08	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	4-Nov-09	$Qstd = \{ [DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc \} / mc$			

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	[DH x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (m ³ /min) X - axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	9.8	3.10	1.54	48.0	47.47
13	7.6	2.73	1.36	40.0	39.56
10	5.5	2.32	1.16	34.0	33.62
7	4.0	1.98	0.99	28.0	27.69
5	2.6	1.59	0.80	20.0	19.78

By Linear Regression of Y on X
 Slope, mw = 36.2268 Intercept, bw = -8.8115
 Correlation Coefficient* = 0.9962
 *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} = 38.71

Remarks: _____

QC Reviewer: Joe Fu Signature: Joe Date: 6 Jul 09

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*: 5 June 2009

*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

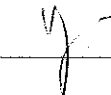
Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
			Temp (°C)	R.H. (%)			
1	06-06-09	09:00 - 10:00	30.2	76	0.04175	1392	23.20
2	06-06-09	10:00 - 11:00	30.6	76	0.03983	1330	22.17
3	06-06-09	11:00 - 12:00	31.0	75	0.04025	1339	22.31
4	06-06-09	13:00 - 14:00	31.2	76	0.04271	1426	23.77

- 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): 0.0018
 Correlation coefficient: 0.9965

Validity of Calibration Record: 5 June 2010

Remarks:

QC Reviewer: YW Fung Signature:  Date: 8 June 2009

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 K_o: 12500
 Last Calibration Date*: 5 June 2009

*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

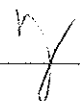
Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
			Temp (°C)	R.H. (%)			
1	04-07-09	11:00 - 12:00	29.7	78	0.03713	1498	24.97
2	04-07-09	12:00 - 13:00	29.7	78	0.03520	1404	23.41
3	04-07-09	14:00 - 15:00	30.1	81	0.03891	1553	25.91
4	04-07-09	15:00 - 16:00	30.1	81	0.04025	1618	26.97

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: 0.9907

Validity of Calibration Record: 3 July 2010

Remarks:

QC Reviewer: YW Fung Signature:  Date: 6 July 2009



CERTIFICATE OF CALIBRATION

Certificate No.: 09CA0611 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	,	88783
Adaptors used:	-	,	-

Item submitted by

Customer Name: ENSR ASIA (HK) LTD.
Address of Customer: Room 1213-1219, Grand Central Plaza, Tower 2, 138 Shatin Rural Committee Rd, Sha Tin, New Territories, HK
Request No.: -
Date of request: 10-Jun-2009

Date of test: 11-Jun-2009

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	12-Jan-2010	CIGISMEC
Signal generator	DS 360	33873	12-Jun-2009	CEPREI
Signal generator	DS 360	61227	18-Jul-2009	CEPREI

Ambient conditions

Temperature: 23 ± 1 °C
Relative humidity: 55 ± 15 %
Air pressure: 995 ± 15 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:

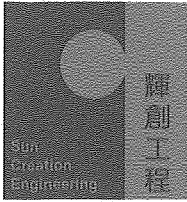

Huang Jian-Min/Feng Jun Qi

Date: 12-Jun-2009

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.



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C083543

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Calibrator

Manufacturer : Rion

Model No. : NC-73

Serial No. : 10307223 (N.004.08)

*has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C083543.*

The equipment is supplied by

Co. Name : ENSR Asia (HK) Limited

*Address : 11/F., Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Rd., Shatin, N.T.*

Date of Issue : 14 July 2008

Certified by :

K C Lee

The test equipment used for testing are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited

c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

Tel: 2927 2606

Fax: 2744 8986

E-mail: callab@suncreation.com

Website: www.suncreation.com



CERTIFICATE OF CALIBRATION

Certificate No.: 09CA0710 04-04

Page: 1 of 2

Item tested

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

Item submitted by

Customer: ENSR ASIA (H.K.) LTD.
Address of Customer: -
Request No.: -
Date of request: 10-Jul-2009

Date of test: 14-Jul-2009

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	23-Jun-2010	SCL
Preamplifier	B&K 2673	2239857	02-Dec-2009	CEPREI
Measuring amplifier	B&K 2610	2346941	03-Dec-2009	CEPREI
Signal generator	DS 360	61227	22-Jun-2010	CEPREI
Digital multi-meter	34401A	US36087050	03-Dec-2009	CIGISMEC
Audio analyzer	8903B	GB41300350	27-Nov-2009	CEPREI
Universal counter	53132A	MY40003662	23-Jun-2010	CEPREI

Ambient conditions

Temperature: 23 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 995 ± 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.

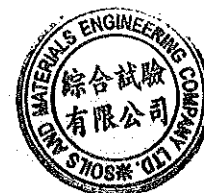
Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:


Huang Jian-Min/Feng Jun Qi

Date: 14-Jul-2009

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.