

Appendix E  
Calibration Record  
(Air Quality Monitoring)



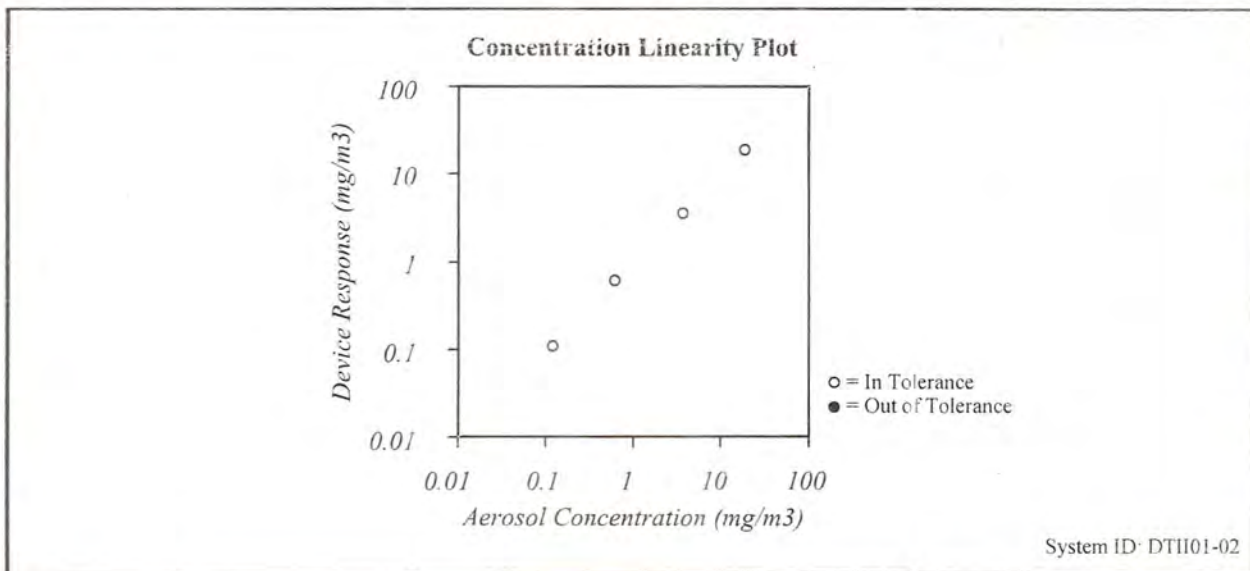


# CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Condition			Model	8520
Temperature	74.7 (23.7)	°F (°C)		
Relative Humidity	22	%RH	Serial Number	85202623
Barometric Pressure	28.94 (980.0)	inHg (hPa)		

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> As Left | <input checked="" type="checkbox"/> In Tolerance |
| <input type="checkbox"/> As Found           | <input type="checkbox"/> Out of Tolerance        |



Zero Stability Results			
Average:	Minimum:	Maximum:	Time:
0.000 :mg/m <sup>3</sup>	0.000 :mg/m <sup>3</sup>	0.001 :mg/m <sup>3</sup>	2.00 :hrs.

*TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1*

Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
Barometric Pressure	E003733	03-27-14	03-27-15	Temperature	E002873	11-05-13	11-05-14
Humidity	E002873	11-05-13	11-05-14	DC Voltage	E003314	01-03-14	01-03-15
DC Voltage	E003315	01-03-14	01-03-15	Photometer	E003319	02-11-14	08-11-14
Microbalance	M001324	01-04-13	01-04-15	Pressure	E003511	11-04-13	11-04-14
Flowmeter	E004025	05-06-13	05-06-14				

*Anamika Chai*  
\_\_\_\_\_  
Calibrated

Final Function  
Check

April 16, 2014  
\_\_\_\_\_  
Date

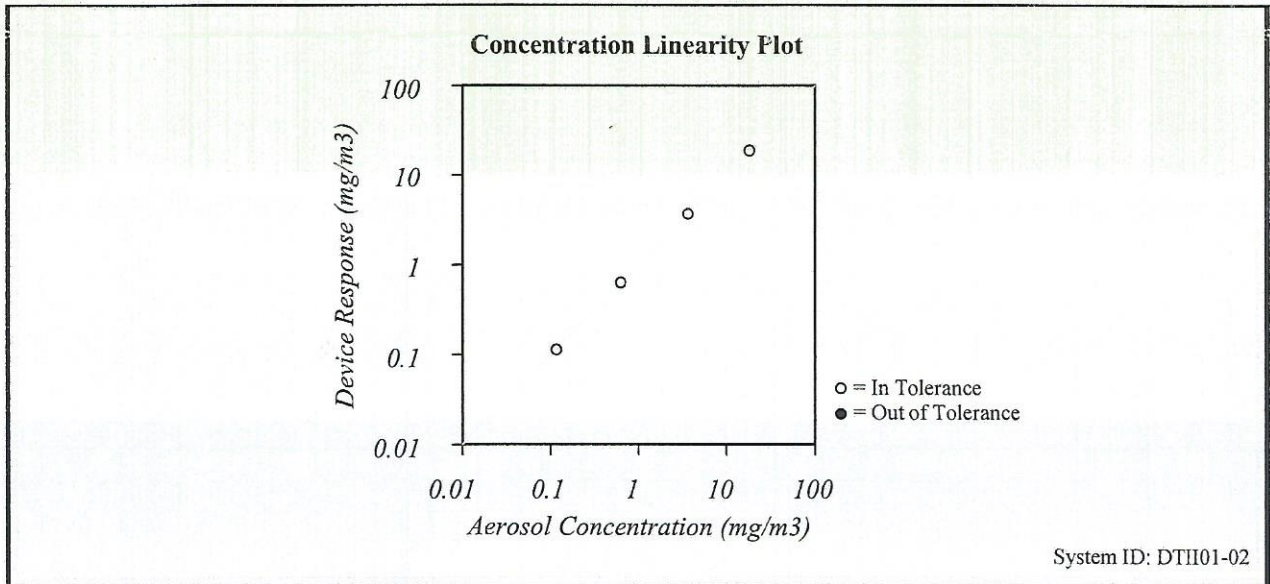


## CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
 Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Condition			Model	8520
Temperature	74.1 (23.4)	°F (°C)	Serial Number	
Relative Humidity	51	%RH		
Barometric Pressure	28.70 (971.9)	inHg (hPa)		
			82378	

<input checked="" type="checkbox"/> As Left	<input checked="" type="checkbox"/> In Tolerance
<input type="checkbox"/> As Found	<input type="checkbox"/> Out of Tolerance



Zero Stability Results			
Average:	Minimum:	Maximum:	Time:
0.000 :mg/m <sup>3</sup>	0.000 :mg/m <sup>3</sup>	0.001 :mg/m <sup>3</sup>	2:00 :hrs.

*TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1*

Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
Barometric Pressure	E003733	03-27-14	03-27-15	Temperature	E002873	11-05-13	11-05-14
Humidity	E002873	11-05-13	11-05-14	DC Voltage	E003314	01-03-14	01-03-15
DC Voltage	E003315	01-03-14	01-03-15	Photometer	E003319	02-11-14	08-11-14
Microbalance	M001324	01-04-13	01-04-15	Pressure	E003511	11-04-13	11-04-14
Flowmeter	E002471	04-30-14	04-30-15				

*[Signature]*  
 \_\_\_\_\_  
 Calibrated

Final Function Check

July 7, 2014

\_\_\_\_\_ Date

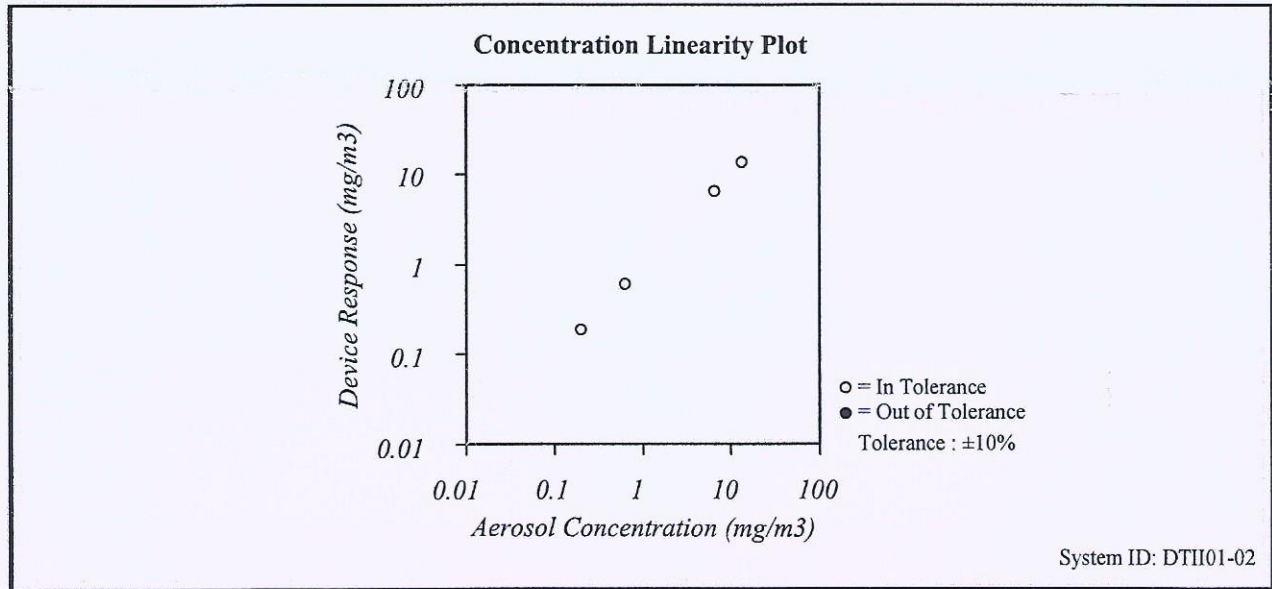


# CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

Environment Condition			Model	AM510
Temperature	73.2 (22.9)	°F (°C)		
Relative Humidity	48	%RH		
Barometric Pressure	29.04 (983.4)	inHg (hPa)		
			Serial Number	11108010

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> As Left | <input checked="" type="checkbox"/> In Tolerance |
| <input type="checkbox"/> As Found           | <input type="checkbox"/> Out of Tolerance        |



TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due		Measurement Variable	System ID	Last Cal.	Cal. Due
Barometric Pressure	E003733	03-27-14	03-27-15		Temperature	E002873	11-05-13	11-05-14
Humidity	E002873	11-05-13	11-05-14		DC Voltage	E003314	01-03-14	01-03-15
DC Voltage	E003315	01-03-14	01-03-15		Photometer	E003319	02-11-14	08-11-14
Microbalance	M001324	01-04-13	01-04-15		Pressure	E003511	11-04-13	11-04-14
Flowmeter	E002471	04-30-14	04-30-15					

*Millie Peterson*  
\_\_\_\_\_  
Calibrated

Final Function  
Check

August 6, 2014

\_\_\_\_\_  
Date

High-Volume TSP Sampler  
5-Point Calibration Record

Location : ASR2A  
Calibrated by : T.K.Wong  
Date : 05/09/2014

Sampler

Model : GMWS-2310 ACCU-VOL  
Serial Number : S/N 1061

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
Service Date : 24 Mar 2014  
Slope (m) : 2.07593  
Intercept (b) : -0.00102  
Correlation Coefficient(r) : 0.99996

Standard Condition

Pstd (hpa) : 1013  
Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1007  
Ta(K) : 305

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	12.0	3.414	1.645	53	52.23
2   13 holes	9.3	3.005	1.448	47	46.32
3   10 holes	7.2	2.644	1.274	42	41.39
4   7 holes	4.6	2.114	1.019	34	33.51
5   5 holes	2.8	1.649	0.795	26	25.62

Sampler Calibration Relationship

Slope(m):31.048 Intercept(b):-1.420 Correlation Coefficient(r):0.9992

Checked by: Magnum Fan

Date: 11/09/2014

High-Volume TSP Sampler  
5-Point Calibration Record

Location : ASR4  
Calibrated by : T.K.Wong  
Date : 05/09/2014

Sampler

Model : GMWS-2310 ACCU-VOL  
Serial Number : S/N 1273

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
Service Date : 24 Mar 2014  
Slope (m) : 2.07593  
Intercept (b) : -0.00102  
Correlation Coefficient(r) : 0.99996

Standard Condition

Pstd (hpa) : 1013  
Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1007  
Ta(K) : 305

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	11.8	3.385	1.631	59	58.15
2   13 holes	9.6	3.054	1.471	53	52.23
3   10 holes	7.4	2.681	1.292	47	46.32
4   7 holes	4.7	2.137	1.030	38	37.45
5   5 holes	2.9	1.678	0.809	30	29.57

Sampler Calibration Relationship

Slope(m):34.464      Intercept(b):1.778      Correlation Coefficient(r):0.9999

Checked by: Magnum Fan

Date: 11/09/2014

High-Volume TSP Sampler  
5-Point Calibration Record

Location : ASR3  
 Calibrated by : T.K.Wong  
 Date : 05/09/2014

Sampler

Model : GMWS-2310 ACCU-VOL  
 Serial Number : S/N 7577

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
 Service Date : 24 Mar 2014  
 Slope (m) : 2.07593  
 Intercept (b) : -0.00102  
 Correlation Coefficient(r) : 0.99996

Standard Condition

Pstd (hpa) : 1013  
 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1007  
 Ta(K) : 305

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	12.4	3.470	1.672	64	63.07
2   13 holes	9.8	3.085	1.487	56	55.19
3   10 holes	7.7	2.735	1.318	49	48.29
4   7 holes	4.8	2.159	1.041	39	38.44
5   5 holes	3.1	1.735	0.836	30	29.57

Sampler Calibration Relationship

Slope(m):39.467      Intercept(b):-3.241      Correlation Coefficient(r):0.9994

Checked by: Magnum Fan

Date: 11/09/2014

High-Volume TSP Sampler  
5-Point Calibration Record

Location : ASR1  
 Calibrated by : T.K.Wong  
 Date : 05/09/2014

Sampler

Model : GMWS-2310 ACCU-VOL  
 Serial Number : S/N 1806

Calibration Office and Standard Calibration Relationship

Serial Number : 2454  
 Service Date : 24 Mar 2014  
 Slope (m) : 2.07593  
 Intercept (b) : -0.00102  
 Correlation Coefficient(r) : 0.99996

Standard Condition

Pstd (hpa) : 1013  
 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1007  
 Ta(K) : 305

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	11.8	3.385	1.631	52	51.25
2   13 holes	8.8	2.924	1.409	46	45.33
3   10 holes	6.9	2.589	1.248	41	40.41
4   7 holes	4.2	2.020	0.973	34	33.51
5   5 holes	2.8	1.649	0.795	28	27.59

Sampler Calibration Relationship

Slope(m): 28.397      Intercept(b): 5.668      Correlation Coefficient(r): 0.9992

Checked by: Magnum Fan

Date: 11/09/2014

High-Volume TSP Sampler  
5-Point Calibration Record

Location : ASR2A  
 Calibrated by : T.K.Wong  
 Date : 05/11/2014

Sampler

Model : GMWS-2310 ACCU-VOL  
 Serial Number : S/N 1061

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
 Service Date : 24 Mar 2014  
 Slope (m) : 2.07593  
 Intercept (b) : -0.00102  
 Correlation Coefficient(r) : 0.99996

Standard Condition

Pstd (hpa) : 1013  
 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1016  
 Ta(K) : 298

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	12.5	3.541	1.706	54	54.08
2   13 holes	9.5	3.087	1.487	47	47.07
3   10 holes	7.4	2.724	1.313	42	42.06
4   7 holes	4.5	2.124	1.024	33	33.05
5   5 holes	2.7	1.646	0.793	25	25.04

Sampler Calibration Relationship

Slope(m):31.528 Intercept(b):0.386 Correlation Coefficient(r):0.9996

Checked by: Magnum Fan

Date: 09/11/2014

High-Volume TSP Sampler  
5-Point Calibration Record

Location : ASR4  
 Calibrated by : T.K.Wong  
 Date : 05/11/2014

Sampler  
 Model : GMWS-2310 ACCU-VOL  
 Serial Number : S/N 1273

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
 Service Date : 24 Mar 2014  
 Slope (m) : 2.07593  
 Intercept (b) : -0.00102  
 Correlation Coefficient(r) : 0.99996

Standard Condition

Pstd (hpa) : 1013  
 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1016  
 Ta(K) : 298

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	11.8	3.440	1.658	50	50.07
2   13 holes	9.3	3.054	1.472	45	45.07
3   10 holes	7.3	2.706	1.304	41	41.06
4   7 holes	4.6	2.148	1.035	34	34.05
5   5 holes	2.6	1.615	0.778	27	27.04

Sampler Calibration Relationship

Slope(m):26.038      Intercept(b):6.927      Correlation Coefficient(r):0.9998

Checked by: Magnum Fan

Date: 09/11/2014

High-Volume TSP Sampler  
5-Point Calibration Record

Location : ASR3  
 Calibrated by : T.K.Wong  
 Date : 05/11/2014

Sampler

Model : GMWS-2310 ACCU-VOL  
 Serial Number : S/N 7577

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
 Service Date : 24 Mar 2014  
 Slope (m) : 2.07593  
 Intercept (b) : -0.00102  
 Correlation Coefficient(r) : 0.99996

Standard Condition

Pstd (hpa) : 1013  
 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1016  
 Ta(K) : 298

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	12.7	3.569	1.720	62	62.09
2   13 holes	10.0	3.167	1.526	56	56.08
3   10 holes	7.7	2.779	1.339	48	48.07
4   7 holes	4.9	2.217	1.068	39	39.06
5   5 holes	3.0	1.735	0.836	31	31.05

Sampler Calibration Relationship

Slope(m):35.514      Intercept(b):1.177      Correlation Coefficient(r):0.9992

Checked by: Magnum Fan

Date: 09/11/2014

High-Volume TSP Sampler  
5-Point Calibration Record

Location : ASR1  
 Calibrated by : T.K.Wong  
 Date : 05/11/2014

Sampler

Model : GMWS-2310 ACCU-VOL  
 Serial Number : S/N 1806

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
 Service Date : 24 Mar 2014  
 Slope (m) : 2.07593  
 Intercept (b) : -0.00102  
 Correlation Coefficient(r) : 0.99996

Standard Condition

Pstd (hpa) : 1013  
 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1016  
 Ta(K) : 298

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	12.0	3.469	1.672	50	50.07
2   13 holes	9.7	3.119	1.503	46	46.07
3   10 holes	7.3	2.706	1.304	41	41.06
4   7 holes	4.4	2.101	1.012	34	34.05
5   5 holes	2.8	1.676	0.808	28	28.04

Sampler Calibration Relationship

Slope(m): 25.287      Intercept(b): 8.003      Correlation Coefficient(r): 0.9993

Checked by: Magnum Fan

Date: 09/11/2014

Appendix E  
Calibration Record  
(Noise Monitoring)



# Certificate of Calibration

## 校正證書

Certificate No. : C137684  
證書編號

### ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC13-3109)

Description / 儀器名稱 : Sound Level Meter  
Manufacturer / 製造商 : Rion  
Model No. / 型號 : NL-52  
Serial No. / 編號 : 00710259  
Supplied By / 委託者 : Envirotech Services Co.  
Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road,  
Hong Kong

### TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$       Relative Humidity / 相對濕度 :  $(55 \pm 20)\%$   
Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 3 December 2013

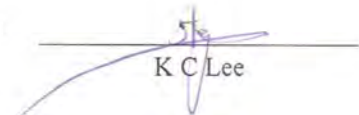
### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.  
All results are within manufacturer's specification.  
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By  
測試

:   
K C Lee

Certified By  
核證

:   
K M Wu

Date of Issue : 4 December 2013  
簽發日期

The test equipment used for calibration are traceable to the Nation Standards as specified on this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載儀器用之測試資料均溯源至國際標準。局部複印本證書請認明本實驗室所發之証章。

# Certificate of Calibration

## 校正證書

Certificate No. : C137684  
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- Self-calibration using the Rion acoustic calibrator NC-73, S/N : 10486660 was performed before the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C130019
CL281	Multifunction Acoustic Calibrator	DC130171

- Test procedure : MA101N.

- Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.2	± 1.1

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.2 (Ref.)
				104.00		104.2
				114.00		114.2

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

- 6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.2	Ref.
			Slow			94.2	± 0.3

# Certificate of Calibration

## 校正證書

Certificate No. : C137684  
證書編號

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>A</sub>	A	Fast	94.00	63 Hz	67.9	-26.2 ± 1.5
					125 Hz	78.0	-16.1 ± 1.5
					250 Hz	85.5	-8.6 ± 1.4
					500 Hz	91.0	-3.2 ± 1.4
					1 kHz	94.2	Ref.
					2 kHz	95.5	+1.2 ± 1.6
					4 kHz	95.2	+1.0 ± 1.6
					8 kHz	93.2	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)

#### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>A</sub>	C	Fast	94.00	63 Hz	93.3	-0.8 ± 1.5
					125 Hz	94.0	-0.2 ± 1.5
					250 Hz	94.2	0.0 ± 1.4
					500 Hz	94.2	0.0 ± 1.4
					1 kHz	94.2	Ref.
					2 kHz	94.1	-0.2 ± 1.6
					4 kHz	93.4	-0.8 ± 1.6
					8 kHz	91.3	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.8	-6.2 (+3.0 ; -6.0)

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 02695

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB : 63 Hz - 125 Hz	: ± 0.35 dB
250 Hz - 500 Hz	: ± 0.30 dB
1 kHz	: ± 0.20 dB
2 kHz - 4 kHz	: ± 0.35 dB
8 kHz	: ± 0.45 dB
12.5 kHz	: ± 0.70 dB
104 dB : 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB : 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

#### Note :

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

All equipment used for calibration are traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full without the prior written approval of this laboratory.

所有用於校準之測試器材均可溯源至國家標準。 - 嚴禁複印本證書或依據本證書內容再作加註。

Sun Creation Engineering Limited - Calibration & Testing Laboratory

7/F, Eco Square Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

香港新界屯門鄉安里一號怡和廣場內

電話 : 2627 2600 Fax 傳真 : 2644 9700

Email 電郵 : cal@suncreation.com Website 網址 : www.suncreation.com



輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

# Certificate of Calibration 校正證書

Certificate No. : C144214

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC14-1719)

Date of Receipt / 收件日期 : 9 July 2014

Description / 儀器名稱 : Sound Level Calibrator

Manufacturer / 製造商 : Rion

Model No. / 型號 : NC-73

Serial No. / 編號 : 10786708

Supplied By / 委託者 : Envirotech Services Co.

Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road,  
Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 :  $(55 \pm 20)\%$

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 15 July 2014

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

All results are within manufacturer's specification.

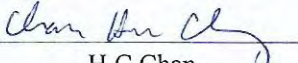
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA


Tested By

測試

  
H C Chan  
Engineer

Certified By

核證

  
K K Wong  
Engineer

Date of Issue

簽發日期

16 July 2014

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory

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

輝創工程有限公司 – 校正及檢測實驗室

c/o 香港新界屯門興安里一號青山灣機樓四樓

Tel/電話: 2927 2606

Fax/傳真: 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

Page 1 of 2



# Certificate of Calibration

## 校正證書

Certificate No. : C144214  
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C143868
CL281	Multifunction Acoustic Calibrator	DC130171
TST150A	Measuring Amplifier	C141558

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.9	± 0.5	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	0.990	1 kHz ± 2 %	± 1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.  
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。



Appendix E  
Calibration Record  
(Water Quality Monitoring)





ALS Technichem (HK) Pty Ltd  
11/F, Chung Shun Knitting Centre  
1-3 Wing Yip Street  
Kwai Chung, N.T., Hong Kong  
T: +852 2610 1044  
F: +852 2610 2021  
www.alsglobal.com

## REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

**CONTACT:** MR IVAN LEUNG  
**CLIENT:** ALS TECHNICHEM (HK) PTY LTD  
**ADDRESS:** 11/F., CHUNG SHUN KNITTING CENTRE,  
1-3 WING YIP STREET,  
KWAI CHUNG,  
N.T., HONG KONG

**WORK ORDER:** HK1433479  
**LABORATORY:** HONG KONG  
**DATE RECEIVED:** 15/10/2014  
**DATE OF ISSUE:** 27/10/2014

### COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test: Conductivity, Dissolved Oxygen, pH, Salinity and Temperature  
Equipment Type: Multifunctional Meter  
Brand Name: YSI  
Model No.: Professional Plus  
Serial No.: 10D101567  
Equipment No.: --  
Date of Calibration: 23 October, 2014

### NOTES

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

  
Mr. Fung Lim Chee, Richard  
General Manager  
Greater China & Hong Kong

# REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

**Work Order:** HK1433479  
**Date of Issue:** 27/10/2014  
**Client:** ALS TECHNICHEM (HK) PTY LTD



**Equipment Type:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** Professional Plus  
**Serial No.:** 10D101567  
**Equipment No.:** --  
**Date of Calibration:** 23 October, 2014      **Date of next Calibration:** 23 January, 2015

**Parameters:**

**Conductivity**

**Method Ref: APHA (21st edition), 2510B**

Expected Reading (uS/cm)	Displayed Reading (uS/cm)	Tolerance (%)
146.9	142.2	-3.2
6667	6299	-5.5
12890	12190	-5.4
58670	55437	-5.5
Tolerance Limit (%)		±10

**Dissolved Oxygen**

**Method Ref: APHA (21st edition), 4500-O: G**

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.99	3.08	+0.09
5.02	4.91	-0.11
8.05	8.02	-0.03
Tolerance Limit (mg/L)		±0.20

**pH Value**

**Method Ref: APHA 21st Ed. 4500H:B**

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.04	+0.04
7.0	6.99	-0.01
10.0	10.08	+0.08
Tolerance Limit (pH unit)		±0.20

**Salinity**

**Method Ref: APHA (21st edition), 2520B**

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	9.67	-3.3
20	19.31	-3.5
30	29.77	-0.8
Tolerance Limit (%)		±10

**Temperature**

**Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.**

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
12.0	12.2	+0.2
22.9	23.0	+0.1
32.4	32.6	+0.2
Tolerance Limit (°C)		±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

  
 Mr. Fung Lim Chee, Richard  
 General Manager -  
 Greater China & Hong Kong



ALS Technichem (HK) Pty Ltd  
11/F, Chung Shun Knitting Centre  
1-3 Wing Yip Street  
Kwai Chung, N.T., Hong Kong  
T: +852 2610 1044  
F: +852 2610 2021  
www.alsglobal.com

## REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

**CONTACT:** MR THOMAS WONG  
**CLIENT:** ENOVATIVE ENVIRONMENTAL SERVICE LTD  
**ADDRESS:** RM811, HIN PUI HOUSE,  
HIN KENG ESTATE,  
TAI WAI,  
N.T., HONG KONG

**WORK ORDER:** HK1435865  
**LABORATORY:** HONG KONG  
**DATE RECEIVED:** 01/11/2014  
**DATE OF ISSUE:** 12/11/2014

### COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test: Turbidity  
Description: Turbidimeter  
Brand Name: HACH  
Model No.: 2100Q  
Serial No.: 09120C000514  
Equipment No.: --  
Date of Calibration: 01 November, 2014

### NOTES

This is the Final Report and supersedes any preliminary report with this batch number.  
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

  
Mr. Fung Lim Chee, Richard  
General Manager -  
Greater China & Hong Kong

# REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

Work Order: HK1435865  
Date of Issue: 12/11/2014  
Client: ENOVATIVE ENVIRONMENTAL SERVICE LTD



Description: Turbidimeter  
Brand Name: HACH  
Model No.: 2100Q  
Serial No.: 09120C000514  
Equipment No.: --  
Date of Calibration: 01 November, 2014      Date of next Calibration: 01 February, 2015

## Parameters:

### Turbidity

Method Ref: APHA 21st Ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.00	--
4	3.78	-5.5
40	42.7	+6.8
80	76.4	-4.5
400	387	-3.3
800	779	-2.6
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.