

# Certificate of Calibration

## 校正證書

Certificate No. : C153870  
證書編號

**ITEM TESTED / 送檢項目** ( Job No. / 序引編號 : IC15-1591 )

Date of Receipt / 收件日期 : 16 July 2015

Description / 儀器名稱 : Acoustical Calibrator  
Manufacturer / 製造商 : Brüel & Kjær  
Model No. / 型號 : 4231  
Serial No. / 編號 : 3004068  
Supplied By / 委託者 : Atkins China Limited  
19/F., Tower 1, The Gateway Harbour City,  
Tsim Sha Tsui, Kowloon

### TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C  
Line Voltage / 電壓 : ---

Relative Humidity / 相對濕度 : (55 ± 20)%

### TEST SPECIFICATIONS / 測試規範

Calibration check

**DATE OF TEST / 測試日期** : 18 July 2015

### 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
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By :   
測試 K O Lee

Project Engineer

Certified By :   
核證 K M Wu

Engineer

Date of Issue : 21 July 2015  
簽發日期

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- 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 :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C153519
CL281	Multifunction Acoustic Calibrator	DC130171
TST150A	Measuring Amplifier	C141558

- Test procedure : MA100N.

- 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	94.0	± 0.2	± 0.2
114 dB, 1 kHz	114.0		

### 5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000 0	1 kHz ± 0.1 %	± 0.1

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.

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# Certificate of Calibration 校正證書

Certificate No. : C153871  
證書編號

**ITEM TESTED / 送檢項目** ( Job No. / 序引編號 : IC15-1591 )      Date of Receipt / 收件日期 : 16 July 2015  
Description / 儀器名稱 : Integrating Sound Level Meter  
Manufacturer / 製造商 : Brüel & Kjær  
Model No. / 型號 : 2238  
Serial No. / 編號 : 2800932  
Supplied By / 委託者 : Atkins China Limited  
19/F., Tower 1, The Gateway Harbour City,  
Tsim Sha Tsui, Kowloon

## TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C      Relative Humidity / 相對濕度 : (55 ± 20)%  
Line Voltage / 電壓 : ---

## TEST SPECIFICATIONS / 測試規範

Calibration check

**DATE OF TEST / 測試日期** : 18 July 2015

## 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
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By :   
測試

K O Lee  
Project Engineer

Certified By :   
核證

K M Wu  
Engineer

Date of Issue : 21 July 2015  
簽發日期

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.

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# Certificate of Calibration

## 校正證書

Certificate No. : C153871  
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 B & K Acoustic Calibrator 4231, S/N : 3004068 was performed before the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL280	40 MHz Arbitrary Waveform Generator	C150014
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 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L <sub>AFP</sub>	A	F	94.00	1	94.1	± 0.7

#### 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L <sub>AFP</sub>	A	F	94.00	1	94.1 (Ref.)
				104.00		104.1
				114.00		114.1

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

### 6.2 Time Weighting

#### 6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L <sub>AFP</sub>	A	F	94.00	1	94.1	Ref.
	L <sub>ASP</sub>		S			94.1	± 0.1
	L <sub>AIP</sub>		I			94.1	± 0.1

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### 6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L <sub>AFP</sub>	A	F	106.0	Continuous	106.0	Ref.
	L <sub>AFMax</sub>				200 ms	105.0	-1.0 ± 1.0
	L <sub>ASP</sub>	S	Continuous		106.0	Ref.	
	L <sub>ASMax</sub>		500 ms		102.0	-4.1 ± 1.0	

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L <sub>AFP</sub>	A	F	94.00	31.5 Hz	54.8	-39.4 ± 1.5
					63 Hz	67.9	-26.2 ± 1.5
					125 Hz	77.9	-16.1 ± 1.0
					250 Hz	85.4	-8.6 ± 1.0
					500 Hz	90.8	-3.2 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	95.3	+1.2 ± 1.0
					4 kHz	95.1	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)

#### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L <sub>CFP</sub>	C	F	94.00	31.5 Hz	91.2	-3.0 ± 1.5
					63 Hz	93.3	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.0
					250 Hz	94.1	0.0 ± 1.0
					500 Hz	94.1	0.0 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.8	-6.2 (+3.0 ; -6.0)

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### 6.4 Time Averaging

UUT Setting				Applied Value					UUT	IEC 60804
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)	Reading (dB)	Type 1 Spec. (dB)
30 - 110	L <sub>Aeq</sub>	A	10 sec.	4	1	1/10	110.0	100	100.0	± 0.5
			60 sec.					90	90.2	± 0.5
			5 min.					80	79.7	± 1.0
								70	69.8	± 1.0

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2793 199

- Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value :

94 dB : 31.5 Hz - 125 Hz	: ± 0.35 dB
250 Hz - 500 Hz	: ± 0.30 dB
1 kHz	: ± 0.20 dB
2 kHz - 4kHz	: ± 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)
Burst equivalent level	: ± 0.2 dB (Ref. 110 dB continuous sound level)

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

#### Note :

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ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 24, 2015 Rootmeter S/N 0438320 Ta (K) - 292  
 Operator Tisch Orifice I.D. - 2454 Pa (mm) - 756.92

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	1.4460	3.2	2.00
2	NA	NA	1.00	1.0300	6.4	4.00
3	NA	NA	1.00	0.9180	7.9	5.00
4	NA	NA	1.00	0.8780	8.7	5.50
5	NA	NA	1.00	0.7240	12.6	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
1.0121	0.6999	1.4258	0.9958	0.6886	0.8784
1.0078	0.9785	2.0163	0.9916	0.9627	1.2422
1.0057	1.0955	2.2543	0.9895	1.0779	1.3888
1.0047	1.1443	2.3644	0.9885	1.1258	1.4566
0.9994	1.3805	2.8515	0.9833	1.3582	1.7568
Qstd slope (m) = 2.09532			Qa slope (m) = 1.31205		
intercept (b) = -0.03812			intercept (b) = -0.02349		
coefficient (r) = 0.99994			coefficient (r) = 0.99994		
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 }

ENVIROTECH SERVICES  
CO. .

**High-Volume TSP Sampler**  
**5-Point Calibration Record**

Location : AMS5(Ma Wan Chung Village)  
Calibrated by : K.F.Ho  
Date : 07/07/2015

**Sampler**

Model : TE-5170  
Serial Number : S/N3640

**Calibration Office and Standard Calibration Relationship**

Serial Number : 2454  
Service Date : 24 Mar 2015  
Slope (m) : 2.09532  
Intercept (b) : -0.03812  
Correlation Coefficient(r) : 0.99994

**Standard Condition**

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

**Calibration Condition**

Pa (hpa) : 1000  
Ta(K) : 304

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	11.6	3.350	1.616	55	54.10
2   13 holes	9.2	2.984	1.440	49	48.20
3   10 holes	6.8	2.565	1.240	43	42.30
4   7 holes	4.3	2.040	0.989	36	35.41
5   5 holes	2.7	1.616	0.787	30	29.51

Notes:  $Z = \sqrt{dH(Pa/Pstd)(Tstd/Ta)}$ ,  $X = Z/m - b$ ,  $Y(\text{Corrected Flow}) = IC * \{\sqrt{Pa/Pstd}(Tstd/Ta)\}$

**Sampler Calibration Relationship**

Slope(m): 29.315 Intercept(b): 6.304

Correlation Coefficient(r): 0.9994

Checked by: Magnum Fan

Date: 10/07/2015



ENVIROTECH SERVICES CO.

**High-Volume TSP Sampler**  
**5-Point Calibration Record**

Location : AMS6(Dragonair Building)  
Calibrated by : P.F.Yeung  
Date : 07/07/2015

**Sampler**

Model : TE-5170  
Serial Number : S/N3639

**Calibration Orifice and Standard Calibration Relationship**

Serial Number : 2454  
Service Date : 24 Mar 2015  
Slope (m) : 2.09532  
Intercept (b) : -0.03812  
Correlation Coefficient(r) : 0.99994

**Standard Condition**

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

**Calibration Condition**

Pa (hpa) : 1000  
Ta(K) : 304

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	11.5	3.336	1.609	55	54.10
2   13 holes	9.2	2.984	1.440	50	49.19
3   10 holes	7.0	2.603	1.258	44	43.28
4   7 holes	4.5	2.087	1.012	36	35.41
5   5 holes	2.8	1.646	0.801	28	27.54

Notes: $Z = \sqrt{dH(Pa/Pstd)(Tstd/Ta)}$ ,  $X = Z/m - b$ ,  $Y(\text{Corrected Flow}) = IC * \{\sqrt{Pa/Pstd}(Tstd/Ta)\}$

**Sampler Calibration Relationship**

Slope(m): 32.765 Intercept(b): 1.803

Correlation Coefficient(r): 0.9992

Checked by: Magnum Fan

Date: 10/07/2015

## EQUIPMENT CALIBRATION RECORD

Type :	Laser Dust Monitor
Manufacturer / Brand :	SIBATA
Model No.:	LD-3B
Equipment No.:	LD-3B-001
Serial No.:	934393
Sensitivity Adjustment Scale Setting :	640 CPM
Last Calibration Date	11/10/2013

### Standard Equipment

Equipment :	MFC High Volume Air Sampler
Venue :	Tung Chung Development Pier
Model No.:	TE-5170 Total Suspended Particulate
Serial No.:	3641

### Calibration Result

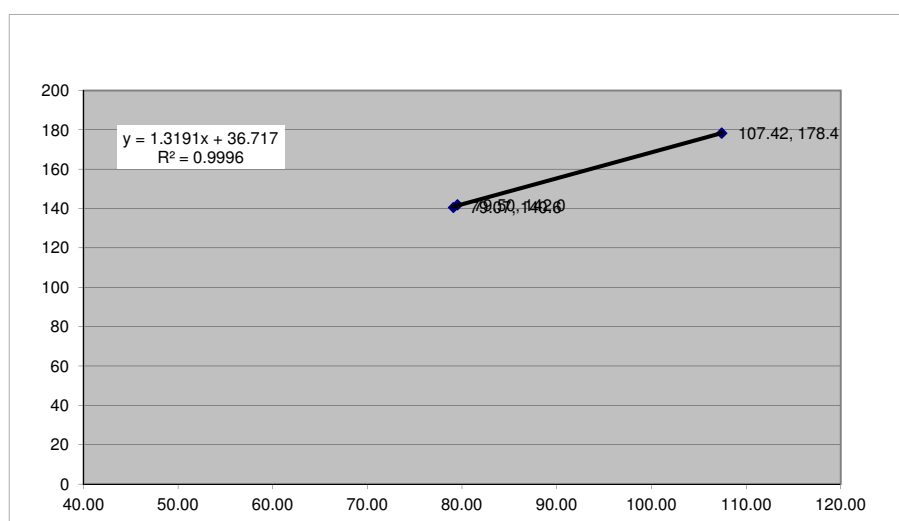
Sensitivity Adjustment Scale Setting (Before Calibration) :	640 CPM
Sensitivity Adjustment Scale Setting (After Calibration) :	640 CPM



Hour	Date (dd-mmm-yy)	Time		Ambient Condition		Concentration (ug/m <sup>3</sup> ) Y-axis	Total Count	Count/Minute X-axis
				Temp (°C)	R.H. (%)			
1	23-Sep-14	14:00	15:00	30	72%	178.4	6445	107.42
2	23-Sep-14	15:35	16:35	30	72%	140.6	4744	79.07
3	23-Sep-14	16:43	17:43	30	72%	142.0	4770	79.50

Be Linear Regression of Y or X

Slope (K-factor):	1.3191
Correlation coefficient :	0.9996

Remark: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



Recorded by: <u>Billy Lao</u>	Signature: <u></u>	Date: <u>29/09/2014</u>
Checked by: <u>Keith Chau</u>	Signature: <u></u>	Date: <u>29/09/2014</u>

## EQUIPMENT CALIBRATION RECORD

Type : Laser Dust Monitor  
 Manufacturer / Brand : SIBATA  
 Model No.: LD-3B  
 Equipment No.: LD-3B-003  
 Serial No.: 276018  
 Sensitivity Adjustment Scale Setting : 799 CPM

Operator: \_\_\_\_\_

### Standard Equipment

Equipment : MFC High Volume Air Sampler  
 Venue : CB FM1a Western Wholesale Food Market  
 Model No.: TE-5170 Total Suspended Particulate  
 Serial No.: 2146

### Calibration Result

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

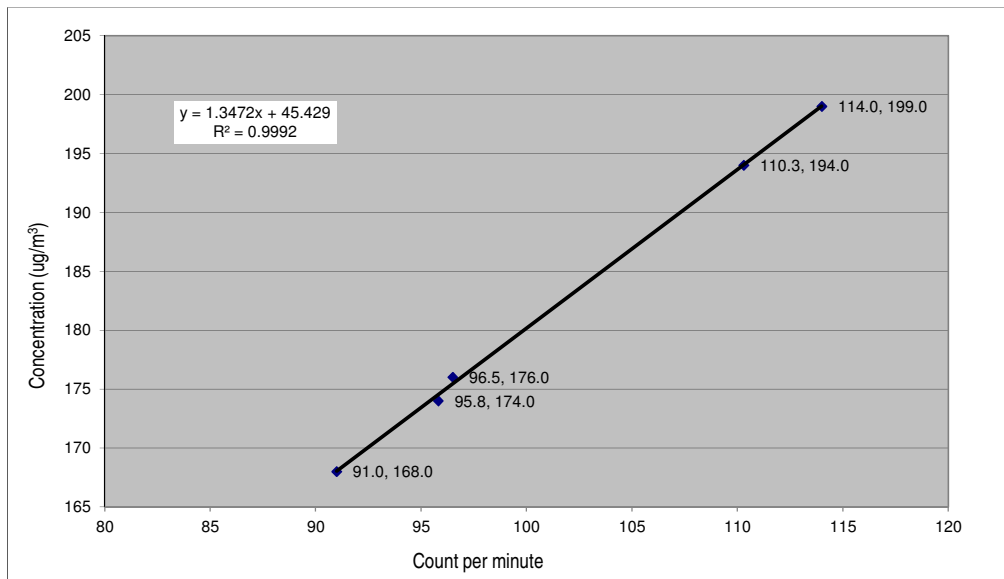
Hour	Date (dd-mmm-yy)	Time		Ambient Condition		Concentration (ug/m <sup>3</sup> ) Y-axis	Total Count	Count/Minute X-axis
				Temp (°C)	R.H. (%)			
1	11-Dec-14	09:30	10:30	19.5	62%	168	5460	91.00
2	11-Dec-14	10:40	11:40	19.5	62%	174	5749	95.82
3	11-Dec-14	11:46	12:46	19.5	62%	176	5790	96.50
4	11-Dec-14	13:00	14:00	19.5	62%	194	6618	110.30
5	11-Dec-14	14:50	15:50	19.5	62%	199	6840	114.00

Be Linear Regression of Y or X

Slope (K-factor): 1.3472

Correlation coefficient : 0.9992

Remark: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



Recorded by: Ruby Law

Signature: 

Date: 19/12/2014

Checked by: Keith Chau

Signature: 

Date: 19/12/2014



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## REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

**CONTACT:** MR MIKE SHEK  
**CLIENT:** AECOM ASIA COMPANY LIMITED  
**ADDRESS:** 1501-10, 15/F, TOWER 1,  
GRAND CENTRAL PLAZA,  
138 SHATIN RURAL COMMITTEE ROAD,  
SHATIN, NEW TERRITORIES, HONG KONG

**WORK ORDER:** HK1514515  
**SUB-BATCH:** 0  
**LABORATORY:** HONG KONG  
**DATE RECEIVED:** 05/05/2015  
**DATE OF ISSUE:** 11/05/2015

### 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, Temperature, Dissolved Oxygen, Salinity, pH and Turbidity  
**Description:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** 6820 V2  
**Serial No.:** 12A101545  
**Equipment No.:** W.026.35  
**Date of Calibration:** 05 May, 2015

### 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:** HK1514515  
**Sub-batch:** 0  
**Date of Issue:** 11/05/2015  
**Client:** AECOM ASIA COMPANY LIMITED

**Description:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** 6820 V2  
**Serial No.:** 12A101545  
**Equipment No.:** W.026.35  
**Date of Calibration:** 05 May, 2015

**Date of next Calibration:** 05 August, 2015

## Parameters:

### Conductivity

Method Ref: APHA (21th edition), 2510B

Expected Reading (uS/cm)	Displayed Reading (uS/cm )	Tolerance (%)
146.9	145.0	-1.3
6667	6610	-0.9
12890	12680	-1.6
58670	58050	-1.1
Tolerance Limit (%)		±10.0

### Dissolved Oxygen

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.35	3.32	-0.03
5.75	5.71	-0.04
7.80	7.77	-0.03
Tolerance Limit (mg/L)		±0.20

### Temperature

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

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)
13.0	12.85	-0.2
26.0	25.91	-0.1
38.0	37.93	-0.1
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

# REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION



**Work Order:** HK1514515  
**Sub-batch:** 0  
**Date of Issue:** 11/05/2015  
**Client:** AECOM ASIA COMPANY LIMITED

**Description:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** 6820 V2  
**Serial No.:** 12A101545  
**Equipment No.:** W.026.35  
**Date of Calibration:** 05 May, 2015

**Date of next Calibration:** 05 August, 2015

**Parameters:**

**Salinity**

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

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)
0	0.00	--
10	10.05	+0.5
20	20.08	+0.4
30	30.06	+0.2
Tolerance Limit (%)		±10.0

**Turbidity**

Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.0	--
4	4.1	+2.5
10	10.2	+2.0
20	20.1	+0.5
50	50.5	+1.0
100	100.8	+0.8
Tolerance Limit (%)		±10.0

**pH Value**

Method Ref: APHA (21st edition), 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.01	+0.01
7.0	6.96	-0.04
10.0	9.99	-0.01
Tolerance Limit (pH Unit)		±0.20

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



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## REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

**CONTACT:** MR MIKE SHEK  
**CLIENT:** AECOM ASIA COMPANY LIMITED  
**ADDRESS:** 1501-10, 15/F, TOWER 1,  
GRAND CENTRAL PLAZA,  
138 SHATIN RURAL COMMITTEE ROAD,  
SHATIN, NEW TERRITORIES, HONG KONG

**WORK ORDER:** HK1527900  
**SUB-BATCH:** 0  
**LABORATORY:** HONG KONG  
**DATE RECEIVED:** 04/08/2015  
**DATE OF ISSUE:** 10/08/2015

### 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, Temperature, Dissolved Oxygen, Salinity, pH and Turbidity  
**Description:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** 6820 V2  
**Serial No.:** 12A101545  
**Equipment No.:** W.026.35  
**Date of Calibration:** 04 August, 2015

### 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:** HK1527900  
**Sub-batch:** 0  
**Date of Issue:** 10/08/2015  
**Client:** AECOM ASIA COMPANY LIMITED



**Description:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** 6820 V2  
**Serial No.:** 12A101545  
**Equipment No.:** W.026.35  
**Date of Calibration:** 04 August, 2015

**Date of next Calibration:** 04 November, 2015

## Parameters:

### Conductivity

Method Ref: APHA (21th edition), 2510B

Expected Reading (uS/cm)	Displayed Reading (uS/cm)	Tolerance (%)
146.9	144.5	-1.6
6667	6630	-0.6
12890	12740	-1.2
58670	58200	-0.8
Tolerance Limit (%)		±10.0

### Dissolved Oxygen

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.40	3.45	+0.05
5.60	5.63	+0.03
7.65	7.61	-0.04
Tolerance Limit (mg/L)		±0.20

### Temperature

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

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)
11.0	11.05	+0.1
23.5	23.57	+0.1
37.5	37.46	-0.0
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



# REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

**Work Order:** HK1527900  
**Sub-batch:** 0  
**Date of Issue:** 10/08/2015  
**Client:** AECOM ASIA COMPANY LIMITED



**Description:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** 6820 V2  
**Serial No.:** 12A101545  
**Equipment No.:** W.026.35  
**Date of Calibration:** 04 August, 2015

**Date of next Calibration:** 04 November, 2015

## Parameters:

### Salinity

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

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)
0	0.00	--
10	10.02	+0.2
20	20.05	+0.3
30	30.04	+0.1
Tolerance Limit (%)		±10.0

### Turbidity

Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.0	--
4	3.9	-2.5
10	10.4	+4.0
20	20.5	+2.5
50	50.6	+1.2
100	100.7	+0.7
Tolerance Limit (%)		±10.0

### pH Value

Method Ref: APHA (21st edition), 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.02	+0.02
7.0	7.03	+0.03
10.0	10.00	0.00
Tolerance Limit (pH Unit)		±0.20

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



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## REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

**CONTACT:** MR MIKE SHEK  
**CLIENT:** AECOM ASIA COMPANY LIMITED  
**ADDRESS:** 1501-10, 15/F, TOWER 1,  
GRAND CENTRAL PLAZA,  
138 SHATIN RURAL COMMITTEE ROAD,  
SHATIN, NEW TERRITORIES, HONG KONG

**WORK ORDER:** HK1514511  
**SUB-BATCH:** 0  
**LABORATORY:** HONG KONG  
**DATE RECEIVED:** 05/05/2015  
**DATE OF ISSUE:** 11/05/2015

### 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, Temperature, Dissolved Oxygen, Salinity, pH and Turbidity  
Description: Multifunctional Meter  
Brand Name: YSI  
Model No.: 6820 V2  
Serial No.: 12D100972  
Equipment No.: W.026.36  
Date of Calibration: 05 May, 2015

### 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:** HK1514511  
**Sub-batch:** 0  
**Date of Issue:** 11/05/2015  
**Client:** AECOM ASIA COMPANY LIMITED



**Description:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** 6820 V2  
**Serial No.:** 12D100972  
**Equipment No.:** W.026.36  
**Date of Calibration:** 05 May, 2015

**Date of next Calibration:** 05 August, 2015

**Parameters:**

**Conductivity**

Method Ref: APHA (21th edition), 2510B

Expected Reading (uS/cm)	Displayed Reading (uS/cm)	Tolerance (%)
146.9	144.0	-2.0
6667	6630	-0.6
12890	12850	-0.3
58670	58520	-0.3
Tolerance Limit (%)		±10.0

**Dissolved Oxygen**

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.35	3.36	+0.01
5.75	5.77	+0.02
7.80	7.81	+0.01
Tolerance Limit (mg/L)		±0.20

**Temperature**

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

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)
13.0	12.95	-0.1
26.0	26.04	+0.0
38.0	37.94	-0.1
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

# REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION



**Work Order:** HK1514511  
**Sub-batch:** 0  
**Date of Issue:** 11/05/2015  
**Client:** AECOM ASIA COMPANY LIMITED

**Description:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** 6820 V2  
**Serial No.:** 12D100972  
**Equipment No.:** W.026.36  
**Date of Calibration:** 05 May, 2015

**Date of next Calibration:** 05 August, 2015

**Parameters:**

**Salinity**

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

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)
0	0.00	--
10	10.04	+0.4
20	20.02	+0.1
30	30.01	+0.0
Tolerance Limit (%)		±10.0

**Turbidity**

Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.0	--
4	4.2	+5.0
10	10.2	+2.0
20	19.9	-0.5
50	50.3	+0.6
100	100.6	+0.6
Tolerance Limit (%)		±10.0

**pH Value**

Method Ref: APHA (21st edition), 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.02	+0.02
7.0	6.97	-0.03
10.0	9.96	-0.04
Tolerance Limit (pH Unit)		±0.20

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

Mr Fung Lim Chee, Richard  
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## **REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION**

**CONTACT:** MR MIKE SHEK  
**CLIENT:** AECOM ASIA COMPANY LIMITED  
**ADDRESS:** 1501-10, 15/F, TOWER 1,  
GRAND CENTRAL PLAZA,  
138 SHATIN RURAL COMMITTEE ROAD,  
SHATIN, NEW TERRITORIES, HONG KONG

**WORK ORDER:** HK1527908  
**SUB-BATCH:** 0  
**LABORATORY:** HONG KONG  
**DATE RECEIVED:** 04/08/2015  
**DATE OF ISSUE:** 10/08/2015

### 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, Temperature, Dissolved Oxygen, Salinity, pH and Turbidity  
Description: Multifunctional Meter  
Brand Name: YSI  
Model No.: 6820 V2  
Serial No.: 12D100972  
Equipment No.: W.026.36  
Date of Calibration: 04 August, 2015

### 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:** HK1527908  
**Sub-batch:** 0  
**Date of Issue:** 10/08/2015  
**Client:** AECOM ASIA COMPANY LIMITED



**Description:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** 6820 V2  
**Serial No.:** 12D100972  
**Equipment No.:** W.026.36  
**Date of Calibration:** 04 August, 2015

**Date of next Calibration:** 04 November, 2015

**Parameters:**

**Conductivity**

Method Ref: APHA (21th edition), 2510B

Expected Reading (uS/cm)	Displayed Reading (uS/cm )	Tolerance (%)
146.9	145.0	-1.3
6667	6700	+0.5
12890	12910	+0.2
58670	58740	+0.1
	Tolerance Limit (%)	±10.0

**Dissolved Oxygen**

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.40	3.34	-0.06
5.60	5.55	-0.05
7.65	7.60	-0.05
	Tolerance Limit (mg/L)	±0.20

**Temperature**

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

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)
11.0	10.96	-0.0
23.5	23.43	-0.1
37.5	37.40	-0.1
	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

# REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

**Work Order:** HK1527908  
**Sub-batch:** 0  
**Date of Issue:** 10/08/2015  
**Client:** AECOM ASIA COMPANY LIMITED



**Description:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** 6820 V2  
**Serial No.:** 12D100972  
**Equipment No.:** W.026.36  
**Date of Calibration:** 04 August, 2015

**Date of next Calibration:** 04 November, 2015

**Parameters:**

**Salinity**

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

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)
0	0.00	--
10	10.05	+0.5
20	20.03	+0.2
30	29.96	-0.1
Tolerance Limit (%)		±10.0

**Turbidity**

Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.0	--
4	4.1	+2.5
10	9.7	-3.0
20	19.5	-2.5
50	49.3	-1.4
100	100.4	+0.4
Tolerance Limit (%)		±10.0

**pH Value**

Method Ref: APHA (21st edition), 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.01	+0.01
7.0	6.99	-0.01
10.0	10.03	+0.03
Tolerance Limit (pH Unit)		±0.20

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