Hong Kong Calibration Ltd.
香 港 校 正 有限公司

Calibration Certificate

Certificate No. 23166 Page 1 of 4 Pages

Customer : Lam Geotechnics Limited

Address : 11/F, Centre Point, 181-185 Gloucester Road, Wanchai, Hong Kong.

Order No. : Q21208 **Date of receipt :** 24-May-12

Item Tested

Description : Precision Integrating Sound Level Meter

Manufacturer : Rion

Model : NL-14 **Serial No. :** 10303242

Test Conditions

Date of Test : 5-Jun-12 **Supply Voltage :** --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure: Z01.

Test Results

All results were within the IEC 651 Type 1 or IEC 804 Type 1 specification after adjustment.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S017	Multi-Function Generator	C101623	SCL-HKSAR
S024	Sound Level Calibrator	15136	NIM-PRC & SCL-HKSAR

The values given in this Calibration 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 environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. 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 International System of Units (SI).
The test results apply to the above Unit-Under-Test only

Calibrated by : P. F. Wong

Approved by : Dorothy Cheuk

Date: 6-Jun-12

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

Calibration Certificate

Results :

1. SPL Accuracy

UUT Setting				Applied Value (dB)	UUT Reading (dB)	
Level Range (dB)	Filter	Weight	Time Const.		Before adjust.	After adjust.
40 – 100	OFF	L_P	Fast	94.0	--	94.1
		L_{PA}	Fast		*92.2	94.1
			Slow		--	94.1
		L_{PC}	Fast		--	94.1
60 – 120	OFF	L_P	Fast	94.0	--	94.0
		L_{PA}	Fast		--	94.0
			Slow		--	94.0
		L_{PC}	Fast		--	94.0
60 – 120	OFF	L_P	Fast	114.0	--	114.1
		L_{PA}	Fast		--	114.1
			Slow		--	114.1
		L_{PC}	Fast		--	114.1

IEC 651 Type 1 Spec. : ± 0.7 dB
Uncertainty : ± 0.2 dB

2. Level Stability : 0.1 dB

IEC 651 Type 1 Spec. : ± 0.3 dB
Uncertainty : ± 0.01 dB

Calibration Certificate

3. Linearity

3.1 Level Linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec. (Primary Indicator Range)
140	114.0	113.9	-0.1	± 0.7 dB
130	104.0	103.9	-0.1	
120	94.0	94.0 (Ref.)	--	
110	84.0	84.0	0.0	
100	74.0	74.1	+0.1	
90	64.0	64.1	+0.1	
80	54.0	54.2	+0.2	

Uncertainty : ± 0.1 dB

3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	84.1	+0.1	± 0.4 dB
	94.0	94.0 (Ref.)	--	
	95.0	95.0	0.0	± 0.2 dB

Uncertainty : ± 0. 1 dB

4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	-39.0	- 39.4 dB, ± 1.5 dB
63 Hz	-25.9	- 26.2 dB, ± 1.5 dB
125 Hz	-15.9	- 16.1 dB, ± 1 dB
250 Hz	-8.5	- 8.6 dB, ± 1 dB
500 Hz	-3.2	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref)	0 dB, ± 1 dB
2 kHz	+1.1	+ 1.2 dB, ± 1 dB
4 kHz	+0.8	+ 1.0 dB, ± 1 dB
8 kHz	-1.5	- 1.1 dB, + 1.5 dB ~ -3 dB
16 kHz	-7.2	- 6.6 dB, + 3 dB ~ - ∞

Uncertainty : ± 0.1 dB

Calibration Certificate

5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	40.0	--
1/10	40.0	39.9	± 0.5 dB
$1/10^2$	40.0	39.7	
$1/10^3$	40.0	39.4	± 1.0 dB
$1/10^4$	40.0	39.3	

Uncertainty : ± 0.1 dB

Remark : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 1 000 hPa.
4. *Out of Specification

---------- END ----------

Hong Kong Calibration Ltd.
香 港 校 正 有限公司

Calibration Certificate

Certificate No. 23167 Page 1 of 2 Pages

Customer : Lam Geotechnics Limited

Address : 11/F, Centre Point, 181-185 Gloucester Road, Wanchai, Hong Kong.

Order No. : Q21208 **Date of receipt :** 24-May-12

Item Tested

Description : Sound Level Calibrator

Manufacturer : Rion

Model : NC-73 **Serial No. :** 10465798

Test Conditions

Date of Test : 6-Jun-12 **Supply Voltage :** --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : F21, Z02.

Test Results

All results were within the manufacturer's specification.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S014	Spectrum Analyzer	13535	NIM-PRC & SCL-HKSAR
S024	Sound Level Calibrator	15136	NIM-PRC & SCL-HKSAR
S041	Universal Counter	15610	SCL-HKSAR
S206	Sound Level Meter	16338	SCL-HKSAR

The values given in this Calibration 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 environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. 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 International System of Units (SI).
The test results apply to the above Unit-Under-Test only

Calibrated by : P. F. Wong

Approved by : Dorothy Cheuk

Date: 6-Jun-12

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

Calibration Certificate

Results :

1. Level Accuracy (at 1 kHz)

UUT Nominal Value	Measured Value	Mfr's Spec.
94 dB	94.43	± 1 dB

Uncertainty : ± 0.2 dB

2. Frequency Accuracy

UUT Nominal Value	Measured Value	Mfr's Spec.
1 kHz	0.982 kHz	± 2 %

Uncertainty : ± 0.1 %

3. Level Stability : 0.0 dB
Uncertainty : ± 0.01 dB

4. Total Harmonic Distortion : < 0.5 %
Mfr's Spec. : < 3 %
Uncertainty : ± 2.3 % of reading

Remark : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. The above measured values are the mean of 3 measurement.
4. Atmospheric Pressure : 1 000 hPa

---------- END ----------

Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. **24235** Page 1 of 4 Pages

Customer : Lam Geotechnics Limited

Address : 11/F, Centre Point, 181-185 Gloucester Road, Wanchai, Hong Kong.

Order No. : Q21745 **Date of receipt :** 4-Jul-12

Item Tested

Description : Sound Level Meter

Manufacturer : B&K

Model : 2250 **Serial No.** : 2722311

Test Conditions

Date of Test : 6-Jul-12 **Supply Voltage** : --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure: Z01.

Test Results

All results were within the IEC 651 Type 1, IEC 804 Type 1 & IEC 1260 Class 1 specification.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S017	Multi-Function Generator	C101623	SCL-HKSAR
S024	Sound Level Calibrator	15136	NIM-PRC & SCL-HKSAR

The values given in this Calibration 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 environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. 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 International System of Units (SI).
The test results apply to the above Unit-Under-Test only

Calibrated by : P. F. Wong

Approved by : Dorothy Cheuk

Date: 6-Jul-12

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

E

Calibration Certificate

Certificate No. 24235

Results :

1. SPL

UUT Setting				Applied Value (dB)	UUT Reading (dB)	
Range	Freq. Wgt.	Time Const.	Center Freq.		Before adjust	After adjust
20 - 140	A (SPL)	Fast	--	94.0	93.5	93.7
		Slow	--		--	93.7
	C (SPL)	Fast	--	94.0	--	93.7
	A (SPL)	Fast	--	114.0	--	113.8
		Slow	--		--	113.8
	C (SPL)	Fast	--	114.0	--	113.8
	--	1/1 – Oct/Fast	1 kHz	94.0	--	93.7
				114.0	--	113.8
	--	1/3 – Oct/Fast	1 kHz	94.0	--	93.6
				114.0	--	113.7

IEC 651 Type 1 Spec. : ± 0.7 dB
Uncertainty : ± 0.1 dB

2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. : ± 0.3 dB
Uncertainty : ± 0.01 dB

3. Linearity

Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Rdg (dB)	Variation (dB)	IEC 651 Type 1 Spec.
20~140	84.0	83.7	0.0	± 0.4 dB
	94.0	93.7 (Ref.)	- -	
	95.0	94.7	0.0	± 0.2 dB

Uncertainty : ± 0.1 dB

Calibration Certificate

4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	-39.4	- 39.4 dB, ± 1.5 dB
63 Hz	-26.2	- 26.2 dB, ± 1.5 dB
125 Hz	-16.2	- 16.1 dB, ± 1 dB
250 Hz	-8.7	- 8.6 dB, ± 1 dB
500 Hz	-3.2	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref)	0 dB, ± 1 dB
2 kHz	+1.2	+ 1.2 dB, ± 1 dB
4 kHz	+0.9	+ 1.0 dB, ± 1 dB
8 kHz	-1.5	- 1.1 dB, + 1.5 dB ~ -3 dB
16 kHz	-6.1	- 6.6 dB, + 3 dB ~ - ∞

Uncertainty : ± 0.1 dB

5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	--	--
1/10	40.0	40.1	± 0.5 dB
$1/10^2$	40.0	40.1	
$1/10^3$	40.0	40.1	± 1.0 dB
$1/10^4$	40.0	40.0	

Uncertainty : ± 0.1 dB

Calibration Certificate

6. Filter Characteristics

6.1 1/1 – Octave Filter

Frequency	Attenuation (dB)	IEC 1260 Class 1 Spec. (dB)
125 Hz	-74.5	< - 61
250 Hz	-53.2	< - 42
500 Hz	-24.0	< - 17.5
707 Hz	-4.8	- 2 ~ - 5
1 kHz (Ref)	--	--
1.414 kHz	-2.8	- 2 ~ - 5
2 kHz	-19.7	< - 17.5
4 kHz	-55.4	< - 42
8 kHz	-85.8	< - 61

Uncertainty : ± 0.25 dB

6.2 1/3 – Octave Filter

Frequency	Attenuation (dB)	IEC 1260 Class 1 Spec.(dB)
326 Hz	-67.7	< - 61
530 Hz	-50.7	< - 42
772 Hz	-24.3	< - 17.5
891 Hz	-4.1	+ 0.3 ~ - 5.0
1 kHz (Ref)	--	--
1.122 kHz	-3.4	+ 0.3 ~ - 5.0
1.296 kHz	-23.0	< - 17.5
1.887 kHz	-47.7	< - 42
3.070 kHz	-69.2	< - 61

Uncertainty : ± 0.25 dB

Remarks : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric pressure : 1000 hPa.
4. The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.

---------- END ----------

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MS EMILY KONG	**WORK ORDER:**	HK1221110
CLIENT:	LAM GEOTECHNICS LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG	**DATE RECEIVED:**	10/08/2012
		DATE OF ISSUE:	14/08/2012
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	Dissolved Oxygen, pH, Salinity and Temperature
Description:	YSI SONDE
Brand Name:	YSI
Model No.:	YSI Professional plus
Serial No.:	11H100476
Equipment No.:	--
Date of Calibration:	13 August, 2012

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.

ISSUING LABORATORY: HONG KONG

Address

ALS Technichem (HK) Pty Ltd

11/F Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung
HONG KONG

Phone: 852-2610 1044
Fax: 852-2610 2021
Email: hongkong@alsglobal.com

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1221110
Date of Issue: 14/08/2012
Client: LAM GEOTECHNICS LIMITED

Description: YSI SONDE
Brand Name: YSI
Model No.: YSI Professional plus
Serial No.: 11H100476
Equipment No.: --
Date of Calibration: 13 August, 2012 Date of next Calibration: 13 November, 2012

Parameters:

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.10	3.06	-0.04
5.65	5.64	-0.01
8.19	8.18	-0.01
	Tolerance Limit (±mg/L)	0.20

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	7.02	0.02
10.0	9.86	-0.14
	Tolerance Limit (±unit)	0.20

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

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	9.74	-2.6
20	18.89	-5.6
30	28.96	-3.5
	Tolerance Limit (±%)	10.0

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)
9.5	9.8	0.3
20.5	21.2	0.7
39.5	38.3	-1.2
	Tolerance Limit (°C)	2.0

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

CASTCO
佳力高試驗中心有限公司
CASTCO TESTING CENTRE LTD.

TEST REPORT
Performance Check / Calibration of Turbidity Meter

Date of issue : 31-07-2012
Page 1 of 1 page(s) Castco LRN: EN0120726-13

Sample details as supplied by customer:-

Customer: Lam Geotechnics Ltd. Customer Ref. No.: --

Address: 11/F., Centre Point, 181-185 Gloucester Rosd, Wanchai, Hong Kong Contract No.: --

Job Title: --

Sample Identification No.: -- Date Sampled: --

Laboratory Test Results:-

Date of sample received: 26-07-2012 Test period: 27-07-2012

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)	Method
0	0.06	--	ENV-WAT-TUR
5	4.53	-9.4	
10	9.08	-9.2	
50	46.0	-8.0	
100	101	+1.0	
200	190	-5.0	

Remark(s):
1. Test results only relate to the specimen tested.
2. Compliance requirement : Tolerance Limit ± 10.0%.
3. Turbidity meter model No.: HACH 2100P.
4. Turbidity meter serial No.: 931000003861.
5. Next Calibration due date: 27-10-2012.
6. Reference method: APHA 21st Ed. 2130B (Nephelometric method).

Checked by : H. T. MA

Certified by : LEE STEPHEN SHU HANG Ph.D. Chief Chemist

End of Report

Form No. ENV CAL Tur T1 dd 26/06/2012

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AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Jul 19, 2012 Rootsmeter S/N 0438320 Ta (K) - 298
Operator Tisch Orifice I.D. - 0005 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	1.3840	3.2	2.00
2	NA	NA	1.00	0.9760	6.4	4.00
3	NA	NA	1.00	0.8730	7.9	5.00
4	NA	NA	1.00	0.8340	8.8	5.50
5	NA	NA	1.00	0.6890	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9850	0.7117	1.4066		0.9957	0.7194	0.8903
0.9809	1.0050	1.9892		0.9915	1.0159	1.2591
0.9788	1.1212	2.2240		0.9894	1.1333	1.4078
0.9777	1.1723	2.3326		0.9883	1.1850	1.4765
0.9725	1.4115	2.8132		0.9831	1.4268	1.7807
Qstd slope (m) =		2.01145		Qa slope (m) =		1.25953
intercept (b) =		-0.02803		intercept (b) =		-0.01774
coefficient (r) =		0.99995		coefficient (r) =		0.99995
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}

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA1b	**Calbration Date**	:	13-Aug-12
Equipment no.	:	EL452	**Calbration Due Dat**	:	13-Oct-12

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	305	Kelvin	**Pressure, P_a**	1015	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	2.01145	**Intercept, bc**	-0.02803
Last Calibration Date	19-Jul-12	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	19-Jul-13	$= m_c \times Q_{std} + b_c$			

Calibration of RSP						
Calibration Point	**Manometer Reading H (inches of water)**			**Q_{std}** (m^3 / min.) **X-axis**	**Continuous Flow Recorder, W** (CFM)	**IC** $(W(P_a/1013.3\times298/T_a)^{1/2}/35.31)$ **Y-axis**
	(up)	(down)	(difference)			
1	6.0	6.0	12.0	1.7177	60	59.3572
2	5.0	5.0	10.0	1.5692	54	53.4215
3	4.0	4.0	8.0	1.4050	47	46.4965
4	2.5	2.5	5.0	1.1137	36	35.6143
5	1.5	1.5	3.0	0.8658	24	23.7429

By Linear Regression of Y on X

Slope, m = 41.2723 Intercept, b = -11.3427

Correlation Coefficient* = 0.9991

Calibration Accepted = Yes/~~No~~**

* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks :

Calibrated by	:	Fung	**Checked by**	:	Derek Lo
Date	:	13-Aug-12	**Date**	:	13-Aug-12

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA5a	**Calbration Date**	:	13-Aug-12
Equipment no.	:	EL380	**Calbration Due Dat**	:	13-Oct-12

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	305	Kelvin	**Pressure, P_a**	1015	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	2.01145	**Intercept, bc**	-0.02803
Last Calibration Date	19-Jul-12	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	19-Jul-13	$= m_c \times Q_{std} + b_c$			

Calibration of RSP						
Calibration Point	**Manometer Reading H (inches of water)**			**Q_{std}** (m^3 / min.) **X-axis**	**Continuous Flow Recorder, W** (CFM)	**IC** ($W(P_a/1013.3\times298/T_a)^{1/2}/35.31$) **Y-axis**
	(up)	(down)	(difference)			
1	6.1	6.1	12.2	1.7318	58	57.3786
2	5.0	5.0	10.0	1.5692	52	51.4429
3	3.7	3.7	7.4	1.3519	44	43.5286
4	2.4	2.4	4.8	1.0915	35	34.6250
5	1.4	1.4	2.8	0.8369	26	25.7215

By Linear Regression of Y on X

Slope, m = 35.3013 Intercept, b = -3.9263

Correlation Coefficient* = 0.9999

Calibration Accepted = Yes/~~No~~**

* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks :

Calibrated by	:	Fung	**Checked by**	:	Derek Lo
Date	:	13-Aug-12	**Date**	:	13-Aug-12

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA4a	**Calbration Date**	:	13-Aug-12
Equipment no.	:	EL390	**Calbration Due Dat**	:	13-Oct-12

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	305	Kelvin	**Pressure, P_a**	1015	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	2.01145	**Intercept, bc**	-0.02803
Last Calibration Date	19-Jul-12	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	19-Jul-13	$= m_c \times Q_{std} + b_c$			

Calibration of RSP						
Calibration Point	**Manometer Reading H (inches of water)**			**Q_{std}** (m^3 / min.) **X-axis**	**Continuous Flow Recorder, W** (CFM)	**IC** ($W(P_a/1013.3 \times 298/T_a)^{1/2}/35.31$) **Y-axis**
	(up)	(down)	(difference)			
1	6.1	6.1	12.2	1.7318	60	59.3572
2	5.0	5.0	10.0	1.5692	53	52.4322
3	3.7	3.7	7.4	1.3519	45	44.5179
4	2.5	2.5	5.0	1.1137	36	35.6143
5	1.4	1.4	2.8	0.8369	26	25.7215

By Linear Regression of Y on X

Slope, m = 37.3619 Intercept, b = -5.8154

Correlation Coefficient* = 0.9996

Calibration Accepted = Yes/~~No~~**

* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks :

Calibrated by	:	Fung	**Checked by**	:	Derek Lo
Date	:	13-Aug-12	**Date**	:	13-Aug-12

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA3a	**Calbration Date**	:	13-Aug-12
Equipment no.	:	EL888	**Calbration Due Dat**	:	13-Oct-12

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	305	Kelvin	**Pressure, P_a**	1015	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	2.01145	**Intercept, bc**	-0.02803
Last Calibration Date	19-Jul-12	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	19-Jul-13	$= m_c \times Q_{std} + b_c$			

Calibration of RSP						
Calibration Point	**Manometer Reading H (inches of water)** (up)	(down)	(difference)	**Q_{std}** (m^3 / min.) **X-axis**	**Continuous Flow Recorder, W** (CFM)	**IC** ($W(P_a/1013.3\times298/T_a)^{1/2}/35.31$) **Y-axis**
1	6.0	6.0	12.0	1.7177	48	47.4858
2	4.7	4.7	9.4	1.5219	41	40.5608
3	3.9	3.9	7.8	1.3875	36	35.6143
4	2.4	2.4	4.8	1.0915	24	23.7429
5	1.5	1.5	3.0	0.8658	15	14.8393

By Linear Regression of Y on X

Slope, m	=	38.5754	Intercept, b	=	-18.3502
Correlation Coefficient*	=	0.9997			
Calibration Accepted	=	Yes/~~No~~**			

* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Fung	**Checked by**	:	Derek Lo
Date	:	13-Aug-12	**Date**	:	13-Aug-12

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA2a	**Calbration Date**	:	13-Aug-12
Equipment no.	:	EL449	**Calbration Due Dat**	:	13-Oct-12

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	305	Kelvin	**Pressure, P_a**	1015	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	2.01145	**Intercept, bc**	-0.02803
Last Calibration Date	19-Jul-12	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	19-Jul-13	$= m_c \times Q_{std} + b_c$			

Calibration of RSP						
Calibration Point	**Manometer Reading H (inches of water)**			**Q_{std}** (m^3 / min.) **X-axis**	**Continuous Flow Recorder, W** (CFM)	**IC** $(W(P_a/1013.3\times298/T_a)^{1/2}/35.31)$ **Y-axis**
	(up)	(down)	(difference)			
1	6.0	6.0	12.0	1.7177	51	50.4536
2	5.0	5.0	10.0	1.5692	44	43.5286
3	3.9	3.9	7.8	1.3875	36	35.6143
4	2.5	2.5	5.0	1.1137	26	25.7215
5	1.4	1.4	2.8	0.8369	14	13.8500

By Linear Regression of Y on X

Slope, m = 40.8952 Intercept, b = -20.3530

Correlation Coefficient* = 0.9992

Calibration Accepted = Yes/~~No~~**

* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks :

Calibrated by	:	Fung	**Checked by**	:	Derek Lo
Date	:	13-Aug-12	**Date**	:	13-Aug-12

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA6a	**Calbration Date**	:	13-Aug-12
Equipment no.	:	EL448	**Calbration Due Dat**	:	13-Oct-12

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	305	Kelvin	**Pressure, P_a**	1015	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	2.01145	**Intercept, bc**	-0.02803
Last Calibration Date	19-Jul-12	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	19-Jul-13	$= m_c \times Q_{std} + b_c$			

Calibration of RSP						
Calibration Point	**Manometer Reading H (inches of water)**			**Q_{std}** (m^3 / min.) **X-axis**	**Continuous Flow Recorder, W** (CFM)	**IC** $(W(P_a/1013.3\times298/T_a)^{1/2}/35.31)$ **Y-axis**
	(up)	(down)	(difference)			
1	6.2	6.2	12.4	1.7458	61	60.3465
2	5.0	5.0	10.0	1.5692	53	52.4322
3	4.1	4.1	8.2	1.4223	46	45.5072
4	2.5	2.5	5.0	1.1137	34	33.6358
5	1.5	1.5	3.0	0.8658	24	23.7429

By Linear Regression of Y on X

Slope, m	=	41.3102	Intercept, b	=	-12.3623
Correlation Coefficient*	=	0.9993			
Calibration Accepted	=	Yes/~~No~~**			

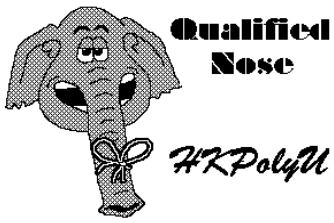
* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Fung	**Checked by**	:	Derek Lo
Date	:	13-Aug-12	**Date**	:	13-Aug-12

Certificate for a Qualified Odour Panel Member



Odour Research Laboratory
The Hong Kong Polytechnic University,
Hung Hom, Kowloon, Hong Kong
Tel: (852) 2766 6011 Fax: (852) 2334 6389

25 June 2012

Re: A Certificate for a Qualified Odour Panel Member

This is to certify that Mr. Ng Kin-hung participated in a set of n-butanol screening tests in our laboratory between Nov 2011 – May 2012 and his odour threshold of n-butanol in nitrogen gas was found to be in the range of 20 – 80 ppb/v. According to the requirement of the European Standard Method of Air Quality – Determination of Odour Concentration by Dynamic Olfactometry (EN13725), he is qualified to participate olfactometry analysis to determine odour concentration.

Yours sincerely

Professor S. C. Lee
Odour Research Laboratory at PolyU