

Appendix D. Calibration Certificates



專業化驗有限公司

QUALITY PRO TEST-CONSULT LIMITED

Unit 10, 14/F, Wah Wai Centre, 38-40 Au Pui Wan St., Fotan, Hong Kong

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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AI080036
Date of Issue : 06 Aug, 2019
Page No. : 1 of 2

PART A – CUSTOMER INFORMATION

Enovative Environmental Service Ltd.
Flat 2207, Yu Fun House,
Yu Chui Court, Shatin
New Territories, Hong Kong
Attn: Mr. Thomas WONG

PART B – DESCRIPTION

Name of Equipment : YSI 6920V2 (Multi-Parameters)
Manufacturer : YSI (a xylem brand)
Serial Number : 17H105557
Date of Received : Aug 02, 2019
Date of Calibration : Aug 02, 2019
Date of Next Calibration^(a) : Nov 02, 2019

PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Parameter	Reference Method
pH at 25°C	APHA 21e 4500-H ⁺ B
Dissolved Oxygen	APHA 21e 4500-O G
Conductivity at 25°C	APHA 21e 2510 B
Salinity	APHA 21e 2520 B
Turbidity	APHA 21e 2130 B
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

PART D – CALIBRATION RESULTS^(b,c)

(1) pH at 25°C

Target (pH unit)	Displayed Reading ^(d) (pH Unit)	Tolerance ^(e) (pH Unit)	Results
4.00	3.98	-0.02	Satisfactory
7.42	7.40	-0.02	Satisfactory
10.01	10.01	0.00	Satisfactory

Tolerance of pH should be less than ± 0.20 (pH unit)

(2) Temperature


Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
11.5	11.3	-0.2	Satisfactory
26.0	25.9	-0.1	Satisfactory
51.5	52.0	0.5	Satisfactory

Tolerance limit of temperature should be less than ± 2.0 (°C)

~ CONTINUED ON NEXT PAGE ~

Remark(s): -

- ^(a) The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted from relevant international standards.
^(b) The results relate only to the calibrated equipment as received
^(c) The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
^(d) "Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.
^(e) The "Tolerance Limit" mentioned is referenced to YSI product specifications.


LEE Chun-ning, Desmond
Senior Chemist



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PART D – CALIBRATION RESULTS (Cont'd)

(3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.01	0.27	0.26	Satisfactory
1.68	1.75	0.07	Satisfactory
4.52	4.81	0.29	Satisfactory
7.84	8.00	0.16	Satisfactory

Tolerance limit of dissolved oxygen should be less than ± 0.50 (mg/L)

(4) Conductivity at 25°C

Conc. of KCl (M)	Expected Reading ($\mu\text{S}/\text{cm}$)	Displayed Reading ($\mu\text{S}/\text{cm}$)	Tolerance (%)	Results
0.001	146.9	152.6	3.9	Satisfactory
0.01	1412	1389	-1.6	Satisfactory
0.1	12890	12452	-3.4	Satisfactory
0.5	58670	58588	-0.1	Satisfactory
1.0	111900	111882	0.0	Satisfactory

Tolerance limit of conductivity should be less than ± 10.0 (%)

(5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	10.08	0.8	Satisfactory
20	20.35	1.8	Satisfactory
30	30.00	0.0	Satisfactory

Tolerance limit of salinity should be less than ± 10.0 (%)

(6) Turbidity

Expected Reading (NTU)	Displayed Reading ^(f) (NTU)	Tolerance ^(g) (%)	Results
0	0.00	--	Satisfactory
10	10.03	0.3	Satisfactory
20	20.11	0.5	Satisfactory
100	100.07	0.1	Satisfactory
800	800.35	0.0	Satisfactory

Tolerance limit of turbidity should be less than ± 10.0 (%)

~ END OF REPORT ~

Remark(s): -

^(f) "Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

^(g) The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted from relevant international standards.



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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AI080035
Date of Issue : 06 Aug, 2019
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PART A – CUSTOMER INFORMATION

Enovative Environmental Service Ltd.
Flat 2207, Yu Fun House,
Yu Chui Court, Shatin
New Territories, Hong Kong
Attn: Mr. Thomas WONG

PART B – DESCRIPTION

Name of Equipment : YSI 6920V2 (Multi-Parameters)
Manufacturer : YSI (a xylem brand)
Serial Number : 18A104824
Date of Received : Aug 02, 2019
Date of Calibration : Aug 02, 2019
Date of Next Calibration^(a) : Nov 02, 2019

PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

<u>Parameter</u>	<u>Reference Method</u>
pH at 25°C	APHA 21e 4500-H ⁺ B
Dissolved Oxygen	APHA 21e 4500-O G
Conductivity at 25°C	APHA 21e 2510 B
Salinity	APHA 21e 2520 B
Turbidity	APHA 21e 2130 B
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

PART D – CALIBRATION RESULTS^(b,c)

(1) pH at 25°C

Target (pH unit)	Displayed Reading ^(d) (pH Unit)	Tolerance ^(e) (pH Unit)	Results
4.00	4.01	0.01	Satisfactory
7.42	7.44	0.02	Satisfactory
10.01	10.00	-0.01	Satisfactory

Tolerance of pH should be less than ± 0.20 (pH unit)

(2) Temperature


Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
11.5	11.4	-0.1	Satisfactory
26.0	25.9	-0.1	Satisfactory
51.5	52.0	0.5	Satisfactory

Tolerance limit of temperature should be less than ± 2.0 (°C)

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Remark(s): -

- ^(a) The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted from relevant international standards.
^(b) The results relate only to the calibrated equipment as received
^(c) The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
^(d) "Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.
^(e) The "Tolerance Limit" mentioned is referenced to YSI product specifications.


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Senior Chemist



REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

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Date of Issue : 06 Aug, 2019
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PART D – CALIBRATION RESULTS (Cont'd)

(3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.01	0.26	0.25	Satisfactory
1.68	1.82	0.14	Satisfactory
4.52	4.83	0.21	Satisfactory
7.84	8.04	0.20	Satisfactory

Tolerance limit of dissolved oxygen should be less than ± 0.50 (mg/L)

(4) Conductivity at 25°C

Conc. of KCl (M)	Expected Reading ($\mu\text{S}/\text{cm}$)	Displayed Reading ($\mu\text{S}/\text{cm}$)	Tolerance (%)	Results
0.001	146.9	144.3	-1.8	Satisfactory
0.01	1412	1394	-1.3	Satisfactory
0.1	12890	12677	-1.7	Satisfactory
0.5	58670	58642	0.0	Satisfactory
1.0	111900	112012	0.1	Satisfactory

Tolerance limit of conductivity should be less than ± 10.0 (%)

(5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	10.06	0.6	Satisfactory
20	20.22	1.1	Satisfactory
30	30.17	0.6	Satisfactory

Tolerance limit of salinity should be less than ± 10.0 (%)

(6) Turbidity

Expected Reading (NTU)	Displayed Reading ⁽¹⁾ (NTU)	Tolerance ⁽²⁾ (%)	Results
0	0.01	--	Satisfactory
10	10.04	0.4	Satisfactory
20	20.09	0.4	Satisfactory
100	100.19	0.2	Satisfactory
800	801.44	0.2	Satisfactory

Tolerance limit of turbidity should be less than ± 10.0 (%)

~ END OF REPORT ~

Remark(s): -

⁽¹⁾ "Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

⁽²⁾ The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted from relevant international standards.



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CALIBRATION REPORT

Test Report No. : AG060168
Date of Issue : Jun 27, 2019
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PART A – CUSTOMER INFORMATION

Enovative Environmental Service Ltd.
Rm 811, Hin Pui House,
Hin Keng Estate, Tai Wai
New Territories, Hong Kong
Attn: Mr. Thomas Wong

PART B – SAMPLE INFORMATION

Description of Samples : Titrette bottletop burette, 50ml
Brand Name : BRAND
Model Number : 1224B90
Serial Number : 10N65665
Equipment Number : --
Date of Received : Jun 16, 2019
Date of Calibration : Jun 19, 2019
Date of Next Calibration^(a) : Sep 19, 2019

PART C – CALIBRATION REQUESTED


<u>Parameter</u>	<u>Reference Method</u>
Accuracy Test	In-house Method (Gravimetric Method)

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Remark(s): -

^(a) The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted from relevant international standards.

APPROVED SIGNATORY :



CHAN Mei-wah Amy
Assistant Lab. Manager



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CALIBRATION REPORT

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PART D – RESULT^{(b),(c)}

Water temperature: 23.5 °C

Relative humidity: 58%

z-Factor: 1.0036

Trial	Nominal volume (mL) at interval				
	3	3	3	3	3
	Range: (1-4)	Range: (16-19)	Range: (23-26)	Range: (34-37)	Range: (42-45)
1	2.9845	2.9774	2.9779	2.9887	2.9797
2	2.9891	2.9842	2.9859	2.9826	2.9866
3	2.9894	2.9745	2.9876	2.9882	2.9808
4	2.9872	2.9882	2.9838	2.9819	2.9702
5	2.9839	2.9825	2.9858	2.9875	2.9892
6	2.9828	2.9886	2.9823	2.9898	2.9805
7	2.9802	2.9845	2.9821	2.9906	2.9776
8	2.9863	2.9833	2.9814	2.9841	2.9793
9	2.9815	2.9909	2.9849	2.9811	2.9825
10	2.9849	2.9808	2.9848	2.9898	2.9807
Average	2.9850	2.9835	2.9837	2.9864	2.9807
Standard deviation	0.0031	0.0051	0.0028	0.0036	0.0051
Calculated volume (mL)	2.9957	2.9942	2.9944	2.9972	2.9914
Error (%)	-0.1425	-0.1923	-0.1870	-0.0940	-0.2853
RSD (%)	0.1022	0.1692	0.0935	0.1211	0.1702

Acceptance Criteria^(d)

Accuracy (%Error)	< ±1%	< ±1%	< ±1%	< ±1%	< ±1%
Precision (%RSD)	< 1%	< 1%	< 1%	< 1%	< 1%

~ END OF REPORT ~

Remark(s): -

^(b) The results relate only to the tested sample as received

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

^(d) The "acceptance criteria" is applicable for similar equipment used by QPT or quoted from relevant international standards.