

ภาคผนวก จ

เอกสารสอบเทียบเครื่องมือที่ใช้ในการตรวจวิเคราะห์

List of Instrument Certificates for Environmental Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration*
1	Analytical Balance	FAT OIL AND GREASE	Mettler Toledo	AB204-S/FACT / 1129361010	United Analyst and Engineering Consultant Co., Ltd.	250422 1-BL002 25	23/4/2025	22/4/2026
2	Analytical Balance	TOTAL DISSOLVED SOLIDS	Mettler Toledo	AB204-S/FACT / 1129361010	United Analyst and Engineering Consultant Co., Ltd.	260318-1-BL007-26	3/4/2026	2/4/2027
			Mettler Toledo	XSR205DU / C210685394	National Food Institute, Ministry of Industry, Thailand	2502226-002-01	20/3/2025	19/3/2026
3	Analytical Balance	TOTAL SUSPENDED SOLIDS	Mettler Toledo	XSR205DU / C210685394	United Analyst and Engineering Consultant Co., Ltd (UAE)	260311-2-BL001-26	12/3/2026	11/3/2027
			Mettler Toledo	XSR205DU / C009071872	National Food Institute, Ministry of Industry, Thailand	2502226-001-01	20/3/2025	19/3/2026
4	BOD Incubator	BIOCHEMICAL OXYGEN DEMAND	ARCO	UC4-1320 / 1021	United Analyst and Engineering Consultant Co., Ltd. (UAE)	260311-2-BL002-26	12/3/2026	11/3/2027
5	DO Meter	BIOCHEMICAL OXYGEN DEMAND	YSI	5100 / 11B 101863	Technology Promotion Association (Thailand-Japan)	24TM1002	7/7/2025	6/7/2026
			YSI	5100 / 11B 101863	Technology Promotion Association (Thailand-Japan)	25TW29	17/2/2025	16/2/2026
6	DO/BOD Meter	BIOCHEMICAL OXYGEN DEMAND	YSI	4010-ZW / 20260326	Technology Promotion Association (Thailand-Japan)	26TW50	2/3/2026	1/3/2027
7	Digestion Units	TOTAL KJELDAHL NITROGEN	FOSS Analytical Co., Ltd (China)	DT2508/2520 / 91905060	Technology Promotion Association (Thailand-Japan)	25TW213	22/10/2025	21/10/2026
8	Digestion Units	TOTAL KJELDAHL NITROGEN	Foss Tecator	2520 Auto / 91794469	FOSS South East Asia	15257	12/2/2026	11/2/2027
9	Cooled Incubator	TOTAL COLIFORM BACTERIA	Binder	KB400 / WTB20200000015535	United Analyst and Engineering Consultant Co., Ltd	แบบบันทึกผลการตรวจสอบค่า ย่อย UAEWAS.011/2560	13/11/2025	12/5/2026
					National Food Institute, Ministry of Industry, Thailand	2602303-006-01	11/3/2026	10/3/2027

List of Instrument Certificates for Environmental Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration*
10	Incubator	TOTAL COLIFORM BACTERIA	Binder	KB400 / 20220000022479	National food Institute ministry of Industry	2503682 004 01	1/7/2025	30/6/2026
11	Incubator	TOTAL COLIFORM BACTERIA	Binder	KB400 / 20220000000391	National Food Institute Ministry of Industry, Thailand	2503287-002-01	5/6/2025	4/6/2026
12	Kjelttec Distillation Unit	TOTAL KJELDAHL NITROGEN	FOSS	KT9 / 91905393	FOSS South East Asia	15256	12/2/2026	11/2/2027
13	pH Meter	pH	EcoSense	pH100A / JCO4744	Technology promotion association (thailand-japan)	25CH408	3/4/2025	2/4/2026
14	pH Meter	pH	Horiba	LAQUA-PH210 / HA0A0005	technology promotion association (thailand-japan)	25CH1433	11/12/2025	10/12/2026
15	pH Meter	pH	Horiba	LAQUA-PH210 / HA9M0047	technology promotion association (thailand-japan)	26CH231	26/2/2026	26/2/2027
16	pH Meter	pH	Horiba	LAQUA-PH210 / HA1M0036	technology promotion association (thailand-japan)	25CH1473	26/12/2025	25/12/2026

Due Date of Calibration* : Based on the annual calibration plan. At least 1 time per year.

Certificate of Calibration

Certificate No.: 250422-1-BL002-25

Code No.: BL002-25

Page: 1 of 3

Customer Name: United Analyst and Engineering Consultant Co., Ltd.
Address: 3 Soi Udomsuk 41, Sukhumvit Rd., Bang Chak, Phra Khanong, Bangkok 10260

Equipment: Electronic Balance

Manufacturer: Mettler Toledo

Model: AB204-S/FACT

Serial No.: 1129361010

Asset No.: UAE.WAS.002/2552

Building: N/A Floor: 1 Room: 107

Received Date: April 22, 2025

Date of Calibration: April 23, 2025

Calibration Conditions: Temperature 22.8 °C to 23.1 °C
Humidity 54.8 % to 68.9 %
Pressure 756.6 mmHg to 758.2 mmHg

Calibrated by: Sakkarin Sirirahang

Approved by: Suwit Chotnok

Signature:

Issued Date: April 25, 2025

Note: 1) The Uncertainties are for a confidence probability of approximately 95%

2) This Certificate is valid only to the item calibrated on date and place of calibration.

3) This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the United Analyst and Engineering Consultant Co., Ltd. (UAE)

เอกสารไม่ควบคุม

Certificate No.: 250422-1-BL002-25

Code No.: BL002-25

Page: 2 of 3

Equipment: Electronic Balance

Manufacturer: Mettler Toledo

Model: AB204-S/FACT

Readability: 0.0001 g

Serial No.: 1129361010

ID No.: UAE.WAS.002/2552

Max. Capacity: 220 g

Calibration Date: April 23, 2025

Condition As-Received: In Condition

Condition of Equipment:

Condition of This Result of Calibration:

1. Calibration Method: This instrument was calibrated by method UAE-OP-CAL-006 In-House Method based on UKAS Lab 14: 2002

2. Reference Standards:

Reference Standard	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Standard Weight Class E2 (0001)	2 mg to 1 kg	0743109122	AMARC	25-002559	Mettler-Toledo	21-Jun-27
Standard Weight Class F1 (0001)	1 mg to 200 g	11115512	AMARC	28-015840	Mettler-Toledo	04+Feb-26

Instrument	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Thermo-Hygro-Baro Meter	WHB-3023C	AK0645T	SUCCESS	SGH-0091787	Sutter (Cal only)	21-Nov-25
Thermo-Hygro-Baro Meter	WHB-3023D	AK0645T	TBA	35PT56	TBA	25-Feb-26

3. This certification is traceable to SI Unit

4. This certification was certified only for the instrument was calibrated

5. This result of calibration was found accurate as show on date and place of calibration only.

6. Through the reference standard laboratory of AMARC 25-009559 Calibration 0152

Calibration Result:

1. Repeatability of Reading:

Nominal Value (g)	Standard Deviation of Reading (g)
100g	0.00045

2. Eccentric or off-center loading:

A mass of 100 g was placed and moved to various position on pan

The Balance reading obtained is given in the table.



1 g)	2 g)	3 g)	4 g)	5 g)	Maximum Difference (g)
100.0000	99.9995	99.9997	100.0003	100.0005	0.0005

เอกสารไม่ควบคุม

Certificate No.: 250422-1-BL002-25

Code No.: BL002-25

Page: 3 of 3

Equipment: Electronic Balance
Model: AB204-S/FACT
Serial No.: 1129361010
Max. Capacity: 220 g
Calibration Date: April 23, 2025

Calibration Results: (Continued)

Calibration Range: 0 - 200 g

Calibration Adjustment: Internal Calibration

3. Error of Indication from nominal or conventional mass value:

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty (± 2 mp)	Coverage Factor k
Unload	0.0000000	0.0000	0.0000	0.10	2.05
0.01	0.0100023	0.0099	0.0001	0.10	2.05
0.05	0.0500054	0.0500	0.0000	0.10	2.05
0.1	0.1000012	0.0999	0.0001	0.10	2.05
0.5	0.5000133	0.5000	0.0000	0.10	2.05
1	1.0000105	1.0000	0.0000	0.10	2.05
10	10.000019	10.0000	0.0000	0.11	2.04
40	40.000076	40.0000	0.0000	0.14	2.00
50	50.000056	50.0000	0.0001	0.14	2.00
80	80.000107	80.0000	0.0001	0.16	2.00
100	100.000109	99.9999	0.0002	0.17	2.00
120	120.000155	119.9999	0.0002	0.21	2.00
150	150.000165	149.9998	0.0003	0.24	2.00
180	180.000175	179.9997	0.0003	0.26	2.00
200	200.000129	199.9998	0.0004	0.30	2.00

4. Effect of Time test:

Test Load (g)	Test Load (g)	Indication (g)	Correction (g)
100	20.000091	19.9999	0.0001
	40.000076	39.9998	0.0002
	60.000056	59.9997	0.0003
	80.000107	79.9996	0.0004
	100.000109	99.9995	0.0004

Remarks:

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k, providing a level of confidence of approximately 95%.

เอกสารไม่ควบคุม

Certificate of Calibration

Certificate No.: 260318-1-BL007-26

Code No.: BL007-26

Page: 1 of 3

Customer Name: United Analyst and Engineering Consultant Co., Ltd.
Address: 3 Soi Udomsuk 41, Sukhumvit Rd., Bang Chak, Phra Khanong, Bangkok 10260

Equipment: Electronic Balance

Manufacturer: Mettler Toledo

Model: AB204-S/FACT

Serial No.: 1129361010

Asset No.: UAE.WAS.002/2552

Building: UAE No.3 Floor: 1 Room: 107

Received Date: April 2, 2025

Date of Calibration: April 3, 2025

Calibration Conditions: Temperature start 21.9 °C end 22.1 °C
Humidity start 60.6 % end 60.1 %
Pressure start 756.6 mmHg end 755.1 mmHg

Calibrated by: Thanachet Chetaphol

Approved by: Suwit Chotnok

Signature:

Issued Date: April 7, 2025

Note: 1) The Uncertainties are for a confidence probability of approximately 95%

2) This Certificate is valid only to the item calibrated on date and place of calibration.

3) This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the United Analyst and Engineering Consultant Co., Ltd. (UAE)

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Certificate No.: 2502226-002-01
Code No.: B1007-26
Page: 2 of 3

Equipment: Electronic Balance
Model: AS204-SFACT
Serial No.: 1129361000
Max. Capacity: 220 g
Calibration Date: April 3, 2020
Condition At Received: in Condition

Manufacturer: Mettler-Toledo
Resolution: 0.0001 g
ID No.: UAE-WAO.010/2565

Condition of This Result of Calibration:

1. Calibration Method: The instrument was calibrated by 1-House Method based on UKAS Lab 24: 2012

2. Reference Standards:

Reference Standard: Model: Serial No.: Calibrated By: Certificate No.: Traceability: Due Date:
Standard Weight Class E2 10.001g 1 mg to 1 kg C310685394 METTLER TOLEDO GmbH C210685394 Mettler-Toledo 3 Mar 27

Instrument: Model: Serial No.: Calibrated By: Certificate No.: Traceability: Due Date:
Thermo Hygro-Bath Meter NPB-3825D AC94457 SUCCEDES SC 11-0099004 TPA 26 Nov 26
Thermo Hygro-Bath Meter NPB-3825D AC94457 TPA 16 Dec 21

3. This certification is traceable to SI unit.
4. This certification was certified only for the instrument we calibrated.
5. This result of calibration was found accurate as shown on date and place of calibration only.
6. Through the reference standard laboratory of Mettler-Toledo GmbH C310685394, SAS accreditation number SAS 0032

Calibration Result:

1. Repeatability of Reading:

Nominal Value (g)	Standard Deviation of Reading (g)
500	0.00010

2. Eccentric or off-center loading:

A mass of 100 g was placed and moved to various position on pan.

The balance reading obtained is given in the table.

1	2	3	4	5	Maximum Difference (g)
(g)	(g)	(g)	(g)	(g)	
100.0015	100.0021	100.0022	100.0027	100.0030	0.0005

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Certificate No.: 2502226-01 B1007-26
Code No.: B1007-26
Page: 3 of 3

Equipment: Electronic Balance
Model: AS204-SFACT
Serial No.: 1129361000
Max. Capacity: 220 g
Calibration Date: April 3, 2020

Manufacturer: Mettler-Toledo
Resolution: 0.0001 g
ID No.: UAE-WAO.010/2565

Calibration Result:

(Continued)

Calibration Range: 0 - 200 g

Calibration Adjustment: Internal Calibration

3. Error of Indication from nominal or conversions, mass value:

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty (2 σ, mg)	Coverage Factor
Unloaded	0.0000000	0.0000	0.0000	0.17	2.37
0.01	0.0100003	0.0099	0.0001	0.17	2.37
0.05	0.0500001	0.0499	0.0001	0.17	2.37
0.1	0.1000003	0.0999	0.0001	0.17	2.37
0.5	0.5000021	0.5000	0.0000	0.17	2.37
1.0	1.0000019	1.0000	0.0000	0.17	2.37
10.0	10.0000003	10.0000	-0.0000	0.17	2.37
50.0	50.0000054	50.0010	-0.0010	0.18	2.37
100.0	100.0000037	100.0015	-0.0015	0.18	2.37
150.0	150.0000093	150.0020	-0.0020	0.19	2.37
200.0	200.0000042	200.0023	-0.0023	0.20	2.37
100.0	100.0000048	100.0028	-0.0028	0.22	2.06
150.0	150.0000079	150.0035	-0.0035	0.24	2.06
100.0	100.0000112	100.0056	-0.0056	0.23	2.06
200.0	200.0000146	200.0049	-0.0049	0.28	2.00

4. Effect of Force test:

Test Load (g)	Test Load (g)	Indication (g)	Correction (g)
100	20.0000238	20.0004	-0.0003
	40.000054	40.0009	-0.0008
	60.000070	60.0013	-0.0013
	80.000090	80.0017	-0.0016
	100.000042	100.0021	-0.0021

Remarks:

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor, providing a level of confidence of approximately 95%.

Calibration Report

Certificate No.: 2502226-002-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.
Address: 3 Soli Udomsak 41, Sukhumvit Road, Bangkok, Prachinong, Bangkok 10260

Certificate No.: 2502226-002-01
Equipment: Electronic Balance
Model: XSR205DU
Serial No.: C210685394
Capacity: 52 g / 220 g
Manufacturer: METTLER TOLEDO
Resolution: 0.0001 g / 0.0003 g
ID No.: UAE-WAO.010/2565

Date of Calibration: 20 March 2023 Page 2 of 4

Environment Condition: Ambient Temperature: 21.3 ± 0.6 °C Relative Humidity: 48 ± 3.5 %

Place of Calibration: 201 Balance Room, UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.

Condition of Equipment: Good Condition

Condition of This Result of Calibration:

1. Calibration Method: NFI Method VP-M-001 1a-House Method based on UKAS Lab 24: 2012

2. Reference Standards:

Reference Standard	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Standard Weight Class E2	1mg to 200g	8505567572	TCS	124941605	19 April 2025
Instrument	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Thermo-Hygro Meter	808-M	NFI.0719.017/23	Quincy Nelson	QNC13-0542	10 February 2026

3. This certification is traceable to SI UNIT

4. This certificate was certified only for the instrument we calibrated.

5. This result of calibration was found accurate as shown on date and place of calibration only.

Calibration Results:

1. Repeatability of Reading:

Nominal Value (g)	Standard Deviation of Reading (g)
40	0.0000042
80	0.0000042
100	0.0000000
200	0.0000006

2. Off-Center Errors

A mass of 100 g was placed and moved to various position on pan.

The balance reading obtained is given in the table.

1	2	3	4	5	6	(Maximum Difference)
(g)	(g)	(g)	(g)	(g)	(g)	(g)
100.0001	100.0001	100.0001	100.0001	100.0000	100.0001	0.0000

Calibrated by: Mr. Yobhin Charoenak
Scientist
Approved by: (Mr. Phiraphat Tuantit)
Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team
Date of Issue: 25 March 2023

The uncertainty is for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme, which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full, except with the prior written approval of the National Food Institute.

UAE-009 Revised: 01 Dec 2019-04

UAE-009 Revised: 01 Dec 2019-04

Certificate No: 2502226-001-01
Code No: 01001-04
Page: 3 of 4

Equipment: Electronic Balance
Model: XS205DU
Serial No: C210685394
Max Capacity: 81 g / 220 g
Calibration Date: March 12, 2024

Calibration Result: (Continued)
Calibration Range: 0 to 80 (g)
Calibration Adjustment: Internal Calibration

3. Error of Indication from nominal or conventional mass values (Range: 0 to 81 (g); Resolution: 0.0001 g)

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty (± mg)	Coverage Factor k
Unload	0.0000000	0.0000	0.0000	0.032	2.63
0.001	0.0010020	0.0010	0.0000	0.032	2.63
0.005	0.0050025	0.0050	-0.0002	0.032	2.63
0.01	0.0100025	0.0100	-0.0002	0.032	2.63
0.05	0.0500003	0.0500	-0.0001	0.032	2.63
0.10	0.1000083	0.1000	0.0001	0.032	2.63
0.50	0.5000120	0.5000	0.0000	0.032	2.63
1	1.0000119	1.0000	-0.0002	0.032	2.59
2	2.0000125	2.0000	-0.0002	0.032	2.59
5	5.0000146	5.0000	-0.0002	0.032	2.63
10	10.0000330	10.0000	-0.0003	0.032	2.63
20	20.000028	20.0000	-0.0003	0.032	2.07
30	30.000061	30.0000	-0.0001	0.032	2.60
40	40.000054	40.0000	-0.0001	0.032	2.06
50	50.000027	50.0000	-0.0002	0.032	2.09
60	60.000078	60.0000	-0.0002	0.032	2.09
80	80.000028	80.0000	-0.0003	0.032	2.09

เอกสารไม่ควบคุม

Certificate No: 2502226-001-01
Code No: 01001-04
Page: 4 of 4

Equipment: Electronic Balance
Model: XS205DU
Serial No: C210685394
Max Capacity: 81 g / 220 g
Calibration Date: March 12, 2024

Calibration Result: (Continued)
Calibration Range: 0 to 220 (g)
Calibration Adjustment: Internal Calibration

3. Error of Indication from nominal or conventional mass values (Range: 0 to 81 (g); Resolution: 0.0001 g)

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty (± mg)	Coverage Factor k
Unload	0.0000000	0.0000	0.0000	0.032	2.63
90	90.0000210	90.0000	-0.0002	0.16	2.00
100	100.0000420	100.0000	-0.0002	0.16	2.00
110	110.0000750	110.0000	-0.0003	0.18	2.00
120	120.0000480	120.0000	-0.0003	0.19	2.00
130	130.0000810	130.0000	-0.0004	0.20	2.00
140	140.0000560	140.0000	-0.0003	0.21	2.00
150	150.0000770	150.0000	-0.0004	0.22	2.00
160	160.0001120	160.0000	-0.0003	0.23	2.00
170	170.0001850	170.0000	-0.0002	0.24	2.00
200	200.0001400	200.0000	-0.0003	0.26	2.00

4. Effect of Turn test:

Turn Load (g)	Test Load (g)	Indication (g)	Correction (g)
100	20.000038	20.0000	0.0000
	40.000034	40.0000	0.0000
	60.000070	60.0000	0.0000
	80.000078	80.0000	0.0001
	100.000059	100.0000	0.0001

Remarks:

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k, providing a level of confidence of approximately 95%.

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เอกสารไม่ควบคุม

Calibration Certificate

Certificate No.: 2502226-001-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.
Address: 3 Sol Udomsuk 41, Sukhumvit Road, Bangkok, Prakhong, Bangkok 10260

Page 1 of 4

Equipment: Electronic Balance
Manufacturer: METTLER TOLEDO
Model: XS205DU
Serial No.: C009071872
ID No.: UAE.WAO.012/2563
Order No.: 2502226
Operation No.: 2502226-001
Date of Receipt: 19 March 2025
Date of Calibration: 20 March 2025

Calibrated by: Mr. Veichin Charoenrak
Scientist

Approved by: (Mr. Praphat Tuanrit)
Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team

Date of Issue: 25 March 2025

The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full, except with the prior written approval of the National Food Institute.

UAE-009 Revision: 01 Date: 20-04-65



Calibration Report

Certificate No.: 2502226-001-01
Equipment: Electronic Balance
Model: XS205DU
Serial No.: C009071872
Capacity: 81 g / 220 g
Manufacturer: METTLER TOLEDO
Resolution: 0.0001 g / 0.001 g
ID No.: UAE.WAO.012/2563

Page 2 of 4

Date of Calibration: 20 March 2025
Environment Condition: Ambient Temperature: 23.2 ± 0.6 °C Relative Humidity: 48 ± 3.5 %

Place of Calibration: 20F Balance Room, UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.

Condition of Equipment: Good Condition

Condition of This Results of Calibration:

1. Calibration Method: NFI Method WMA-001 In-House Method based on OIML Lab 14 : 2005

2. Reference Standards

Reference Standard	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Standard Weight Class E2	1mg to 100g	3901967972	TCS	104-041003	19 April 2025
Instrument	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Thermo-Hygro Meter	608-411	NFI.07110.17223	Quayle Reborn	0125-0542	10 February 2025

3. This certificate is traceable to SI UNIT

4. This certificate was certified only for the instruments we calibrated.

5. This report of calibration was found accurate as shown on page and page of calibration only.

Calibration Results:

1. Repeatability of Reading:

Nominal Value (g)	Standard Deviation of Reading (g)
40	0.0000002
60	0.0000004
100	0.0000003
200	0.0000002

2. Off-Center Error:

A mass of 100 g was placed and moved to various position on pan.

The average reading obtained is given in the table.



1	2	3	4	5	6	(Maximum Difference)
(g)	(g)	(g)	(g)	(g)	(g)	(g)
100.0001	100.0001	100.0001	100.0001	100.0001	100.0002	0.0001

UAE-012 Revision: 01 Date: 20-04-65





Certificate No.: 250311-0-01-002-25
Code No.: BL002-25
Page: 3 of 4

Certificate No.: 250311-0-01-002-25
Code No.: BL002-25
Page: 4 of 4

Equipment: Electronic Balance
Model: XS6030U
Serial No.: C009071872
Max. Capacity: 81 g / 220 g
Calibration Date: March 12, 2025

Manufacturer: Mettler Toledo
Readability: 0.1 mg
ID No.: UAE.WAO.012/2563

Equipment: Electronic Balance
Model: XS6030U
Serial No.: C009071872
Max. Capacity: 81 g / 220 g
Calibration Date: March 12, 2025

Manufacturer: Mettler Toledo
Readability: 0.1 mg
ID No.: UAE.WAO.012/2563

Calibration Results: (Continued)
Calibration Range: 0 to 80 g
Calibration Adjustment: Internal Calibration

Calibration Results: (Continued)
Calibration Range: 0 to 80 g
Calibration Adjustment: Internal Calibration

3. Error of indication from nominal or conventional mass value: (Range: 0 to 80 g; Resolution: 0.0001 g)

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty (± mg)	Coverage Factor
Unload	0.000000	0.0000	0.0000	0.015	2.25
0.001	0.0010020	0.0010	0.0000	0.015	2.25
0.005	0.0050025	0.0050	-0.0002	0.015	2.25
0.01	0.0100025	0.0100	-0.0002	0.015	2.25
0.05	0.0500030	0.0500	-0.0001	0.015	2.25
0.10	0.1000030	0.1000	-0.0001	0.015	2.25
0.50	0.5000121	0.5000	-0.0002	0.015	2.15
1	1.0000115	1.0000	-0.0001	0.015	2.12
2	2.0000123	2.0000	-0.0001	0.017	2.09
3	3.0000144	3.0000	-0.0002	0.020	2.05
10	10.0000350	10.0000	-0.0003	0.025	2.00
20	20.0000228	20.0000	-0.0003	0.030	2.00
30	30.0000261	30.0000	-0.0004	0.031	2.00
40	40.000034	40.0000	-0.0004	0.033	2.00
50	50.000037	50.0000	-0.0004	0.034	2.00
60	60.000030	60.0000	-0.0004	0.034	2.00
80	80.000038	80.0000	-0.0004	0.11	2.00

3. Error of indication from nominal or conventional mass value: (Range: 0 to 80 g; Resolution: 0.0001 g)

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty (± mg)	Coverage Factor
Unload	0.000000	0.0000	0.0000	0.02	2.25
10	10.0000110	10.0000	0.0000	0.16	2.09
100	100.0000420	100.0000	0.0000	0.15	2.09
110	110.0000750	110.0000	0.0000	0.17	2.09
120	120.0000680	120.0000	0.0001	0.18	2.09
130	130.0001010	130.0000	0.0000	0.20	2.00
140	140.0000950	140.0000	0.0001	0.21	2.00
150	150.0000790	150.0000	0.0001	0.21	2.00
160	160.0001120	160.0000	0.0001	0.23	2.00
170	170.0001050	170.0000	-0.0003	0.23	2.00
200	200.0001480	200.0000	-0.0002	0.26	2.00

4. Effect of Tare test

Tare Load (g)	Test Load (g)	Indication (g)	Correction (g)
100	20.000028	20.0000	0.0000
	40.000034	40.0000	-0.0001
	60.000076	60.0000	-0.0001
	80.000098	80.0000	-0.0001
	100.000042	100.0000	-0.0002

Remarks

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor, according to level of confidence of approximately 95%.

o-o-End-o-o

เอกสารไม่ควบคุม

เอกสารไม่ควบคุม



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
53/4 PATTANAKARN ROAD FOR 18, SOANLIANG, SOANLIANG BANGKOK 10250
TEL: 0-2717-3002-29 FAX: 0-2719-9484



Certificate of Calibration

Cert. No.: 25TM1002
Page: 1 of 3

Equipment: BOD Incubator
Manufacturer: ARCO
Model: UCA-1320
Serial No.: -
ID No.: UAE.WAO.002/2550
Submitted by: United Analyst and Engineering Consultant Co., Ltd.
351 Udomsak Road, Sukhumvit Road, Bangkok, Phrahanong, Bangkok 10260
Location: Lab Floor 2
Received Order: 07 July 2025
Calibration Date: 07 July 2025
Ambient Temperature: (25 ± 1) °C
Relative Humidity: (50 ± 30) %
AC Line Voltage: (220 ± 22) V
Calibrated by: Man Pattanapongpaiboon
Approved by:
() Chakrit Waiyaywong
() Suwit Injai
(✓) Kunhit Prompret
Issue Date: 17 July 2025



Equipment: BOD Incubator
Condition As-Received: Used Item
Reference: 2507-01460C-3
Procedure Used:-

Cert. No.: 25TM1002
Page: 2 of 3

Calibration was conducted using calibration procedure CP-DT02 based on TLAS 0-20 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD).
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY8003411	24LM102	TPA	24 Dec 2025

2. This certificate is valid only to the item calibrated on date and place of calibration.

3. This measurement result is traceable to the International System of Unit maintained through:

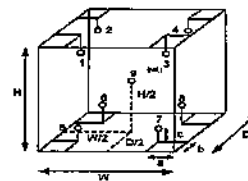
Remark: TPA: Technology Promotion Association (Thailand + Japan)

Result of Calibration: () Without Adjustment

Function of UUC: Temperature Source

Fresh air setting: Not Available

Environment during calibration		
	Beginning	Finished
Temp. (°C)	28	28
REL Humid. (%)	57	58
AC Supply (Vsk)	223	228



Probe Installation Details:

a = 10 cm
b = 10 cm
c = 10 cm

Dimension of Chamber:

D = 0.62 m
W = 1.2 m
H = 1.2 m
Capacity = 0.89 m³

Position	Ref. Std. ID No.
1	25-20RTD-2/1
2	25-20RTD-2/2
3	25-20RTD-2/3
4	20RTD-2/4
5	20RTD-2/5
6	20RTD-2/6
7	20RTD-2/7
8	20RTD-2/8
9 (ref.)	20RTD-2/9

The Uncertainty are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the Head of Corporate Services 3: Equipment Calibration and Testing Services.

เอกสารไม่ควบคุม

เอกสารไม่ควบคุม



Equipment: BOD Incubator
Condition As-Received: Used Item
Reference: 2507-014600-3
Result of Calibration: (°) Without Adjustment
Function of UUC*: Temperature Source
Fresh air setting: Not Available

Cert. No.: 25TM1002
Page: 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor K
20.0	20.0	19.8	0.48	0.48	1.2	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (± °C)
	1	2	3	4	5	6	7	8	9 (ref.)	
20.0	20.226	20.266	20.121	19.807	19.871	20.065	19.872	19.953	19.926	0.72

Average*: The average of 30 values in each position.
Temperature stability: One-half of the greatest maximum difference of measured temperature at any one sensor.
Temperature uniformity: The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Overall Variation: The Difference of the maximum and minimum measured temperatures throughout observation.
UUC*: Unit Under Calibration.

Note: The reported uncertainty of measurement was included stability and excluded uniformity.

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor K, providing a level of confidence of approximately 95 %.

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เอกสารไม่ควบคุม



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES
334/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2317-3000 FAX. 0-2317-9384

Certificate of Testing

Cert.No.: 25TW29
Page: 1 of 2

Equipment: DO Meter
Manufacturer: YSI
Model: 5100
Serial No.: 11B 101863
ID No.: UAE.WAO.004/2554
Received Date: 14 February 2025
Test Date: 17 February 2025
Reference: 2502-0473DSC-1
Submitted by: United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsak 41, Sukhumvit Road, Bangkok, Phrakhanong, Bangkok 10280
Laboratory Condition: Temperature (25 ± 5) °C
Humidity (50 ± 20) %
Test Procedure: In-house method: GP-GH9
by Comparison Technique with Azide Modification Method

Tested by: Wadlak Sirithan

Approved by:

Approved Signatory

() Chakrit Waewarajus
() Ponpen Paipim
(✓) Seikhp Meangmei

Issue Date: 18 February 2025

เอกสารไม่ควบคุม



Cert.No.: 25TY29
Page: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments:

This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1. Burette	-	180BU10	23CG1172	22 Mar 2025
2. Balance	14233821	110RC001	24MM181	04 July 2025

2. Standard Material >

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate 5-Hydrate AR	KEMAS	2203162447	99.6%

Result: Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 24F100202

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
0.22	0.22	0.0055

This report was certified only for the instrument we tested. It is allowable to use for study intend to use for advertising and referral purpose is prohibited. This report may not be reproduced either in full, without written approval of the laboratory.

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เอกสารไม่ควบคุม

เอกสารไม่ควบคุม



Certificate of Testing

Cert.No.: 26TW50
Page.: 1 of 2

Equipment : DO Meter
Manufacturer : YSI
Model : 6100
Serial No. : 11B 101863
ID No. : UAE.WAO.004/2554
Received Date : 27 February 2026
Test Date : 02 March 2026
Reference : 2602-0915080-1
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Sol Udomsuk 41, Sukhumvit Road, Bangkok,
Phrakhanong, Bangkok 10260
Laboratory Condition : Temperature (25 ± 5) °C
Humidity (50 ± 20) %
Test Procedure : In - house method : CP-CH9
by Comparison Technique with Azide Modification Method
Tested by : Walailak Sirikhean
Approved by :
() Chakrit Wawwanjua
() Ponpan Palpin
(✓) Sathip Meengmal
Issue Date : 03 March 2026

เอกสารไม่ควบคุม



Condition of this result of calibration

1. Reference Standard Instruments :
This measurement result is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	ID No.	Certificate No.	Due Date
1. Burette	130BU10	25CG1125	18 Mar 2027
2. Balance	110RC001	25MM316	02 July 2026

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate 5-Hydrate AR	KEMAJUS	2203162447	99.8%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 24F10202

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.20	8.20	0.0084

This report was certified only for the instrument we tested. It is allowable to use for study
intend to use for advertising and referral purpose is prohibited. This report may not be reproduced
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เอกสารไม่ควบคุม



Certificate of Testing

Cert.No.: 25TW213
Page.: 1 of 2

Equipment : DO Meter
Manufacturer : YSI
Model : 4010-2W
Serial No. : 20260326
ID No. : UAE.WAO.0002503
Received Date : 17 October 2025
Test Date : 23 October 2025
Reference : 2510-0505080-1
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Sol Udomsuk 41, Sukhumvit Road, Bangkok,
Phrakhanong, Bangkok 10260
Laboratory Condition : Temperature (25 ± 5) °C
Humidity (50 ± 20) %
Test Procedure : In - house method : CP-CH9
by Comparison Technique with Azide Modification Method
Tested by : Walailak Sirikhean
Approved by :
() Chakrit Wawwanjua
() Ponpan Palpin
(✓) Sathip Meengmal
Issue Date : 23 October 2025

เอกสารไม่ควบคุม



Condition of this result of calibration

1. Reference Standard Instruments :
This measurement result is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	ID No.	Certificate No.	Due Date
1. Burette	130BU10	25CG1120	18 Mar 2027
2. Balance	110RC001	25MM316	02 July 2026

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate 5-Hydrate AR	KEMAJUS	2203162447	99.8%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 221H102365

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.22	8.31	0.0055

This report was certified only for the instrument we tested. It is allowable to use for study
intend to use for advertising and referral purpose is prohibited. This report may not be reproduced
other in full, without written approval of the laboratory

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เอกสารไม่ควบคุม

Customer Service Report

Date: Feb 12, 2026
Job No.: 14590
Instrument: D72520

FOSS South East Asia	
3388 Siriratt Building, 25th - 26th Floor, Unit No. 3388/3D, Maru IV Road, Klongton, Klongtoey, Bangkok, Thailand 10110	
Report No.:	15257
Customer:	JAE
Address:	Bangkok
Serial:	9 19 05 060

	Travel To Customer (Hrs)	Labour (Hrs)	Travel From Customer (Hrs)
Start	-	13.30	-
Finish	-	15.00	-

Job Type					
Application	Special	Standard			
Distributor	Courtesy Visit	Installation	In House		
Digital Service	PMA Approval Check	Quote	PM		✓
Internal	Warranty	Repair	HC/VIS		
Training	Sales Support	Investigate	Others		

PMA Type	Smartcare	Smartcare Pro	Foscare	✓
	Smartcare Advance	Foscare Pro	N/A	

Details of Work / Task			
	-PM		
-Visual Check			
+ No leak	-ok		
+ No Damage	-ok		
-Change PM In-1	+ 827	-Sh	
-Function Check			
+ Switch work			
+ Set Temp / Time	-ok		
+ Run	-ok		
-Heating	-ok		
+ Lift up/down	-ok		
-Clean xdr Velos with brush head			
Instruments of Ready for Use	OK	✓	Not OK

Part No:	Batch	Description	Cty
6009980	27.04.2016	Fold P/N kit, D. germar 20 per, 12 mmf	A

I confirm this report is accurate and complete			
Signed FOS:		Signed Customer:	
Name:		Name:	
Tel:		Tel:	
Email:		Email:	

เผยแพร่ในนิตยสาร

130E.FM 4.4.028-14079-SEP-2020

แบบนับที่ผลการทวนสอบเตาย่อย (Heating Block/Digestion Unit)

รายละเอียดเครื่องมือที่ใช้ตรวจสอบ	หมายเลขประจำเครื่องวัด: 1111, 1111, 1111, 1111
เครื่องมือ : มิเตอร์วัดความดัน	ยี่ห้อ : Koss, Teco
หมายเลขเครื่องมือ : 11111111	รุ่น : 1111, 1111
หมายเลขใบทดสอบ : 11111111-1111-11	วันที่สอบเทียบ : 11/11/11
รายละเอียดเครื่องมือที่ใช้ตรวจสอบ (Reference Standard) : มิเตอร์วัดความดัน	
เครื่องมือ : มิเตอร์วัดความดัน	ยี่ห้อ : Koss, Teco
หมายเลขเครื่องมือ : 11111111	รุ่น : 1111, 1111
หมายเลขใบทดสอบ : 11111111-1111-11	วันที่สอบเทียบ : 11/11/11
รายละเอียดเครื่องมือที่ใช้ตรวจสอบ (Reference Standard) : มิเตอร์วัดความดัน	
เครื่องมือ : มิเตอร์วัดความดัน	ยี่ห้อ : Koss, Teco
หมายเลขเครื่องมือ : 11111111	รุ่น : 1111, 1111
หมายเลขใบทดสอบ : 11111111-1111-11	วันที่สอบเทียบ : 11/11/11
รายละเอียดเครื่องมือที่ใช้ตรวจสอบ (Reference Standard) : มิเตอร์วัดความดัน	
เครื่องมือ : มิเตอร์วัดความดัน	ยี่ห้อ : Koss, Teco
หมายเลขเครื่องมือ : 11111111	รุ่น : 1111, 1111
หมายเลขใบทดสอบ : 11111111-1111-11	วันที่สอบเทียบ : 11/11/11

หมายเหตุ: Calibration Point 331. °C Setting Point 332. °C	อุณหภูมิที่อ่านได้จากนาฬิกา (°C)				อุณหภูมิที่อ่านได้จาก Reference Standard (°C)			
	Digester Unit				Unit: 480, 604, 7565 ; Thermax-160			
					Unit: 480, 604, 7565 ; Thermax-160			
	ครั้งที่ 1	ครั้งที่ 2	ค่าเฉลี่ย	คิดความผิดพลาด	ครั้งที่ 1	ครั้งที่ 2	ค่าเฉลี่ย	คิดความผิดพลาด
								Correction 0.0
A1	380	380	380	-	378.3	378.3	378.5	378.5
A2	381	381	381	-	380.7	380.3	380.5	380.5
A3	381	380	381	-	380.8	380.3	380.4	380.4
A4	381	381	381	-	381.4	381.7	381.3	381.3
B1	381	381	380	-	381.1	380.9	381.1	381.1
B2	380	381	381	-	380.3	380.9	380.7	380.7
B3	380	381	381	-	381.7	380.7	380.6	381.0
B4	381	381	381	-	380.7	381.7	381.0	381.0
C1	380	380	380	-	380.7	380.3	380.4	380.4
C2	380	381	381	-	380.7	380.3	380.5	380.5
C3	380	380	380	-	380.5	380.9	380.7	380.7
C4	381	380	381	-	380.7	381.3	381.0	381.0

หมายเลขคดี : ก๊อปใบแจ้งหนี้ ๖๕๕-๕๖

1/2

เอกสารไม่ควบคุม

¹ www.netpage.com.au/links-to-our-instruments/01-2/analysis-of-the-survey-questions-for-use-by-researchers.aspx [Accessed 19th May 2016].



สถาบันพัฒนาบุคลากรด้านอาหาร
ศูนย์บริการข้อมูลอาหารอุตสาหกรรมอาหาร
Foundation for Industrial Development National Food Institute
Food Industrial Laboratory Service Centre



Calibration Certificate

Certificate No.: 2602301-105-01
Page: 1 of 2

Equipment:	CHAMBER (neutral)
Manufacturer:	BINDER
Model:	K8 420
Serial No.:	23200002015535
ID No.:	WAEWNG Q182584
Order No.:	2542903
Operation No.:	2602303-006
Date of Receipt:	15 March 2026
Date of Calibration:	15 March 2026

Customer Name: UNITED ANALYST AND ENGINEERING CONSULTANT CO. LTD
Address: 355 Unsubud Rd, Singapore Road
Bangkok, Prachinong Bangkok 10010

Metrological traceability:

- This instrument was calibrated by inserting 2 standard thermometers into its chamber, in accordance with IN-TE-014, issued on 7/15/02-0208 (E) Guidelines for Calibration and Checks of Temperature Controlled Enclosures
- The thermometer used in this laboratory is the International Temperature Scale of 1990 (ITS-90)
- All data shown below are final values, and the final data may be obtained upon request

2. Reference Standard instrument

Instrument	Model/Type	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer w/h sensor	DAGETSA RTD	HY05000904 CMA001250 RTD0201205	2507244-001-01	29 March 2026	NATIONAL FOOD INSTITUTE

3. The certificate is traceable to the International System of Units (SI).
4. This certificate is valid only for the instrument that was calibrated.
5. The result of this calibration was found to be accurate only on the scale and at the place of calibration shown.

Calibrated by Mr. Nutsapol Hiyomethai
Snehalini

Approved by: 
(Mr Phaeprai Yuanji)
Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team

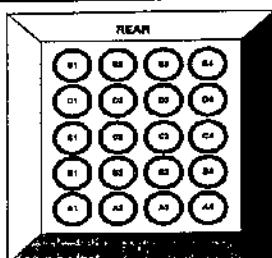
Date of issue: 18 March 2020

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and is traceable to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full, except with the prior written approval of the National Food Institute.

4.05.000 Revision 02 Date 01-10-84

**អង្គការយុវជន (៧៦)**

หน่วยอุณหภูมิ	อุณหภูมิห้องที่จากหน่วย (°C)				อุณหภูมิห้องที่จาก Reference Standard (°C)			
	Digester Unit				Digester Unit			
	วันที่ 1	วันที่ 2	ค่าเฉลี่ย	ความแตกต่าง	วันที่ 1	วันที่ 2	ค่าเฉลี่ย	ความแตกต่าง
Calibration Point: 330 °C	Unit was 331.15 °C				Unit was 330.155 °C			
Setting Point: 330 °C								
D1	330	331	331	-	330.9	331.3	331.1	331.6
D2	330	331	331	-	331.3	331.7	331.5	331.5
D3	331	331	331	-	331.9	331.5	331.7	331.7
D4	331	330	331	-	331.6	330.1	330.4	330.4
E1	331	331	331	-	331.6	331.8	331.7	331.1
E2	331	331	331	-	330.7	331.1	330.9	330.9
E3	330	331	331	-	332.1	331.9	332.0	332.0
E4	331	330	330	-	330.1	331.5	330.9	330.9
ค่าเฉลี่ย	-	-	-	-	-	-	-	-
ค่าความเบี่ยงเบนมาตรฐาน	-	-	-	-	-	-	-	-
ค่าความผิดพลาด	พิจารณาจากความแตกต่างและข้อผิดพลาดในการวัดตามการประเมิน							
เกณฑ์การยอมรับ	380 ± 5 °C							
ผลการตรวจสอบ								



ผู้บันทึก.....
วันที่ ๑๓/๑๑/๖๖

ผู้ว่าราชการย., [Redacted] [Redacted]
วันที่..... ๒๕๖๓/๕๔.....
เอกสารไม่ควบคุม

Calibration Certificate

Certificate No.: 250362-004-01
Page: 2 of 2

Calibration Condition:

Equipment: CHAMBER (Incubator) Place of Calibration: Microbiology Laboratory
UUC* Resolution: 0.1 °C UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.
Condition of the item: Normal & Good Environment Conditions: Ambient Temperature (23.0 ± 1.0 °C
Relative Humidity (55 ± 10 %
Line Voltage (230 ± 5 V.
Time of record: 1 hour 9 minute 10 second Unit Voltage (230 ± 2 V.

Calibration Result:

Table 1 : Reporting of Temperature

Calibration point (°C)	Std.1	Std.2	Std.3	Std.4	Std.5	Std.6	Std.7	Std.8	Std.9	Std.10	Uncertainty (°C)
35.0	34.76	34.83	34.81	34.83	35.21	35.71	35.52	35.12	34.63	34.63	0.28

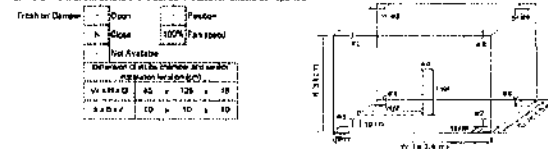
Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	Min	UUC* Reading (°C)	Max	Average	Stability (°C)	Uniformity (°C)	Overall Variation (°C)
35.0	35.0	35.0	35.0	35.0	0.024	0.38	0.62

Note

- UUC* = Unit Under Calibration
- The quoted uncertainty includes contributions from Stability and Loading effect (20% of Temperature Uniformity)
- Stability = One-half of the greatest maximum difference of measured temperatures at any one sensor, for at least half an hour after reaching steady state
- Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time
- Overall Variation = The difference of the maximum and minimum measured temperatures throughout observation time

For more information, details of the sensor installation should be reported



The report uncertainty measurement was based on standard uncertainty multiplied by coverage factor k = 2, providing a level of confidence of approximately 95 %

----- End of Report -----

F-C5-002 Revision: 02 Date: 20-04-65



Calibration Certificate

Certificate No.: 250362-004-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.
Address: 3 Sol Udomsak 43, Sukhumvit Road,
Bangchack, Prakhong, Bangkok 10250

Page 1 of 3

Equipment: CHAMBER (Incubator)

Manufacturer: BINDER

Model: KB 400

Serial No.: 2022000022479

ID No.: UAE/MC.026/2566

Order No.: 250362

Operation No.: 250362-004

Date of Receipt: 1 July 2025

Date of Calibration: 1 July 2025

Calibrated by: Mr. Pharephat Tuenjit Approved by: (Miss. Praveena Jangjornmit)
Scientist: Vice President, Department of Laboratory Services
Date of Issue: 3 July 2025 Responsible for the Technical Management Team

The uncertainty is for a confidence probability of approximately 95 %

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

F-C5-002 Revision: 01 Date: 20-04-65



Calibration Report

Certificate No.: 250362-004-01
Equipment: CHAMBER (Incubator)
Model: KB 400 Serial No.: 2022000022479
Resolution: 0.1 °C ID No.: UAE/MC.026/2566
Manufacturer: BINDER
Date of Calibration: 1 July 2025 Page 2 of 3

Location: Microbiology Laboratory, UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.
Environment Condition:
Ambient Temperature (23 ± 1) °C
Relative Humidity (55 ± 10) %
Line Voltage (230 ± 5) Volt

Condition of this results of Calibrations

- This instrument was calibrated by insert 13 standard thermometer into its chamber and calibration according to WTB-014 Based on TIAS G-20 / 102-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
- The temperature scale used was based on ITS - 90.
- All data show below were final values and the initial data may be obtained upon request.

Reference Standard Instrument:

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	1475000377	2501168-000-01	13 January 2026	NATIONAL FOOD INSTITUTE

3. This certificate is traceable to International System of Units (SI Units).

4. This certificate was certified only for the instrument we calibrated.

5. This result of calibration was found accurate as shown on date and place of calibration only.

6. Condition of Calibrated Item : Good

UUC Description:

Time of Record: 1 Hour 9 Minute 10 Second At 35.0 °C

Fresh or Damper: Open Position

X Close Pan 100%

Not Available

7. Result of Calibration: X Without adjustment After adjustment

F-C5-012 Revision: 01 Date: 20-04-65



Calibration Report

Certificate No.: 250362-004-01
Equipment: CHAMBER (Incubator)
Model: KB 400 Serial No.: 2022000022479
Resolution: 0.1 °C ID No.: UAE/MC.026/2566
Manufacturer: BINDER
Date of Calibration: 1 July 2025 Page 3 of 3

Calibration point: 35.0 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Vrms)
Min	20.1	45	225.0
Max	22.0	65	235.6

Table 1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.13 is REF)													Uncertainty (°C)
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	
35.0	35.19	35.03	34.83	35.21	34.95	34.94	34.81	34.81	35.06	34.94	35.15	34.79	34.92	0.22

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading (°C)			Temperature Stability (°C)	Temperature Uniformity (°C)	Overall Variation (°C)
	Min	Max	Average			
34.8	34.8	34.8	34.8	0.040	0.28	0.50

Note: The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity) "

UUC* = Unit Under Calibration

Stability = One-half of the greatest maximum difference of measured temperatures at any one sensor, for at least half an hour after reaching steady state.

Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.

Overall Variation = The difference of the maximum and minimum measured temperatures throughout observation time.

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k = 2, providing a level of confidence of approximately 95 %.

----- End -----

F-C5-012 Revision: 01 Date: 20-04-65



Calibration Certificate

Certificate No.: 2503287-002-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.
Address: 3 Soi Uthomrak 41, Sukhumvit Road,
 Bangchack, Prakhong, Bangkok 10260

Page 1 of 3

Equipment: CHAMBER (Incubator)
Manufacturer: BINDER
Model: KB 400
Serial No.: 2022000000391
ID No.: UAE.MIC.029/2585
Order No.: 2503287
Operation No.: 2503287-002
Date of Receipt: 5 June 2025
Date of Calibration: 5 June 2025

Calibrated by: Mr. Phraphat Tungsit
 Scientist
Approved by: [Signature]
 (Miss Preeyaporn Jaengnam)
 Vice President, Department of Laboratory Services
 Responsible for the Technical Management Team

Date of Issue: 11 June 2025

The uncertainties are for a confidence probability of approximately 95 %.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

FOSS-009 Revision 01 Date: 20-04-65

Calibration Report

Certificate No.: 2503287-002-01
Equipment: CHAMBER (Incubator)
Model: KB 400 **Serial No.:** 2022000000391
Resolution: 0.1 °C **ID No.:** UAE.MIC.029/2585
Manufacturer: BINDER
Date of Calibration: 5 June 2025

Page 2 of 3

Location: Room 302 Microbiology Laboratory, UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.
Environment Conditions: Ambient Temperature: (18 ± 1) °C
 Relative Humidity: (50 ± 6) %
 Line Voltage: (230 ± 5) Volt

Condition of this result of Calibration:

- This instrument was calibrated by insert 15 standard thermometer into its chamber and calibration according to WTE-014 Based on TIS 5-20-1/02-26 (Eq. Guidelines for Calibration and Checks of Temperature Controlled Environments).
 - The temperature scale used was based on ITS - 90.
 - All data show below were final values and the initial data may be obtained upon request.

2. Reference Standard Instrument:

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	3492ZA	HY59003377	2501168-001-01	13 January 2026	NATIONAL FOOD INSTITUTE
RTD	CW101-201 / RTD (CO-201)				

- This certificate is traceable to International System of Units (SI Units).
- This certificate was certified only for the instrument we calibrated.
- This result of calibration was found accurate as shown on date and place of calibration only.
- Condition of Calibrated Item: Good

UUC Description:

Time of Record: 1 Hour 9 Minute At: 25.0 °C
 Fresh air Damper: ☒ Open Position ☐ Close Position
 Fan: ☒ Not Available ☐ Fan 100%

- Result of Calibration: ☒ Without adjustment ☐ After adjustment

FOSS-012 Revision: 01 Date: 20-04-65

Calibration Report

Certificate No.: 2503287-002-01
Equipment: CHAMBER (Incubator)
Model: KB 400 **Serial No.:** 2022000000391
Resolution: 0.1 °C **ID No.:** UAE.MIC.029/2585
Manufacturer: BINDER
Date of Calibration: 5 June 2025

Calibration point: 35.0 °C

Page 2 of 3

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Vrms)
MIN	17.4	45	225.0
MAX	18.5	59	235.0

Table 1: Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.13 is REF)													Uncertainty ± (°C)
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	
35.0	35.08	35.11	35.01	35.13	35.17	35.09	34.98	34.86	35.15	35.05	35.06	34.86	35.06	0.27

Table 2: Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading (°C)			Temperature Stability ± (°C)	Temperature Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
35.0	35.0	35.1	35.0	0.038	0.17	0.34

Note: The quoted uncertainty include "Stability" and "Loading effect (20% of Temp Uniformity)"
 UUC* = Unit Under Calibration
 Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors, for at least half an hour after reaching steady state.
 Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.
 Overall Variation = The difference of the maximum and minimum measured temperatures throughout observation time.
 The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k=2, providing a level of confidence of approximately 95 %.

FOSS-002 Revision: 01 Date: 20-04-65

FOSS Customer Service Report

Date: Feb 12, 2026
Job No.: 14589
Instrument: H19 Distillator

FOSS South East Asia
 3344 Sathat Building, 25th - 26th Floor, Unit No. 3344/20,
 Rama IV Road, Klongton, Klongtoey, Bangkok, Thailand 10110

Report No.: 15256
Customer: UAE
Address: Bangkok
Serial: 91405343

Start	Travel To Customer (Hrs)	Labour (Hrs)	Travel From Customer (Hrs)
Finish	08:30 09:40	07:30 13:20	4

Job Type			
Application	Special	Installation	Standard
Distribute	Courtesy Visit	Drift	In House
Digital Service	FMA Approval Check	Repair	PM
Internal	Warranty	Investigate	HC VMT
Training	Sales Support		Others

FMA Type	SmartCare	SmartCare Plus	Forecast
	SmartCare Advance	Forecast Pro	N/A

Details of Work / Test

- Visual Check	- OK
- No leak	- OK
- No damage	- OK
- change BM test ± 1 Set	- OK
- Function Check	- OK
- Diffusion	- OK
- Alarm	- OK
- Recursion	- Not OK
- Alarm (Down)	- OK

Instrument Ready for Use	OK	NO	Not OK

Part No.	Batch	Description	Qty
60150146	19-03-1045	0.5 kg Reptiles in Dist-Filter	1

I confirm this report is accurate and complete	
Signed FOSS	Signed Customer
Name:	Name:
Tel:	Tel: 011 750 7684
Email:	Email: Pitsya.Bakumua@gmail.com

Remark: [Signature]
 Please scan QR code



Certificate of Calibration

Cert.No.: 25GH408
Page: 1 of 3

Equipment: pH Meter
Manufacturer: EcoSense
Model: pH100A
Serial No.: JC04744
ID No.: UAE.EFM.058/2566 (EFM.pH.01/66)
Condition As-Received: Used Item
Received Date: 01 April 2025
Calibration Date: 03 April 2025
Reference: 2504-0031WSC-1
Submitted by: United Analyst and Engineering Consultant Co., Ltd.
3 Sol Udomsuk 41, Sukhumvit Road, Bangkok,
Phraekhanong, Bangkok 10260

Ambient Temperature: (25 ± 2.5) °C
Relative Humidity: (50 ± 15) %
Calibration Procedure: In-house method:
- CP-CH5 by direct measurement with DC voltage
standard and direct measurement with
certified reference material (CRM)
- CP-CH5 by comparison with temperature standard

Calibrated by: Watsak Sirthean
Approved by: [Signature]
Approved Signatory

() Chakrit Watanwanjua
() Pongpan Palpin
(✓) Sathip Meangmai

Issue Date: 4 April 2025

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	5403049	130RC116	24E2759	25 Aug 2025
2) Ref. Standard Thermometer	4682054	110RC044	24I767	14 July 2025

- This Certification is traceable to SI Through Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials

- The measurement results are traceable to SI through Hach Lange GmbH Ltd.
Deutsche Alkaliwerke, Accredited No.D-99A-15184-01-00
- The measurement results are traceable to SI through CPA chem Ltd.
ANAB-ASQ National Accreditation Board, Accredited No. AN-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.007	CPA chem	1088565	18 Jan 2027
pH 6.999	Hach Lange GmbH	0303220	29 Oct 2026
pH 10.010	CPA chem	1088569	18 Jan 2026

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration Results

Function: mV Measurement

Performing standard curve by Document Process Calibrator at pH (4.7)(7.10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (mV)	Coverage factor k
			mV	pH		
pH Meter S/N: JC04744	4.00	177.48	177	4.01	0.58	2.00
	7.00	0.00	0	7.00	0.58	2.00
	7.00	0.00	0	7.00	0.58	2.00
	10.00	-177.48	-177	10.01	0.58	2.00

The Uncertainties are for a confidence probability of approximately 95%.

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.

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Cert.No.: 25GH406
Page: 3 of 3

Calibration Results

Function: pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4.7)(7.10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (pH)	Coverage factor k
pH Electrode S/N: 24071051A05377	4.007	4.01	173	0.0085	2.05
	6.999	7.00	-2	0.0085	2.00
	6.999	7.00	-2	0.0085	2.00
	10.010	10.00	-175	0.0085	2.00

Function: Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model: [Blank]
- Serial No.: 24071051A05377
Dimension of probe
- Length: 110 mm.
- Diameter: 12 mm.
- Immersion Depth: 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
19.0	15.000	14.9	-0.100	0.13	2.00
30.0	30.001	29.9	-0.101	0.13	2.00
45.0	45.002	45.0	-0.002	0.13	2.00

Remark: - UUC* = Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

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เอกสารไม่ควบคุม



Certificate of Calibration

Cert.No.: 25GH433
Page: 1 of 3

Equipment: pH Meter
Manufacturer: Horiba
Model: LAQUA-PH210
Serial No.: HADA0005
ID No.: UAE.EFM.004/2563(EFM.pH.04/63)
Condition As-Received: Used Item
Received Date: 09 December 2025
Calibration Date: 11 December 2025
Reference: 2512-0243WSC-2
Submitted by: United Analyst and Engineering Consultant Co., Ltd.
3 Sol Udomsuk 41, Sukhumvit Road, Bangkok,
Phraekhanong, Bangkok 10260

Ambient Temperature: (25 ± 2.5) °C
Relative Humidity: (50 ± 15) %
Calibration Procedure: In-house method:
- CP-CH5 by direct measurement with DC voltage
standard and direct measurement with
certified reference material (CRM)
- CP-CH5 by comparison with temperature standard

Calibrated by: Watsak Sirthean
Approved by: [Signature]
Approved Signatory

(✓) Chakrit Watanwanjua
() Pongpan Palpin
() Sathip Meangmai
Issue Date: 12 December 2025

The Uncertainties are for a confidence probability of approximately 95%.

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Cert.No.: 25CH1433
Page: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Exp. Date
1) Document Process Calibrator	54030049	130RC116	25E2743	25 Aug 2026
2) Ref. Standard Thermometer	4982054	110RC044	25I706	03 July 2026

- This measurement result is traceable to SI through Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials

(The measurement results are traceable to SI through Hach Lange GmbH Ltd., Deutsche Akkreditierungsstelle, Accredited No. D-RM-15194-01-00)
(The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AP-1836)

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.007	CPA chem	1114384	12 June 2027
pH 6.999	Hach Lange GmbH	C03273	13 May 2027
pH 10.010	CPA chem	1114385	06 June 2026

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration Results

Function : mV Measurement

Performing standard curve by Document Process Calibrator at pH (4.7)(7.19)

Unit Under Calibration	Nominal Value		Standard Voltage Input		Actual Reading		Uncertainty of Measurement (mV)	Coverage factor k
	pH	mV	mV	pH	mV	pH		
pH Meter S/N.: HAQAD005	4.00	177.48	177.4	4.01	0.058	2.00	0.058	2.00
	7.00	0.00	0.1	7.00	0.058	2.00	0.058	2.00
	7.00	0.00	0.1	7.00	0.058	2.00	0.058	2.00
	10.00	-177.46	-177.2	10.01	0.058	2.00	0.058	2.00



Cert.No.: 25CH1433
Page: 3 of 3

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4.7)(7.19)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (%)	Coverage factor k
pH Electrode S/N.: -	4.007	4.01	176.4	0.0085	2.05
	6.999	7.00	-0.3	0.0095	2.00
	6.999	7.01	-0.6	0.0096	2.00
	10.010	10.01	-170.8	0.0082	2.00

Function : Temperature Measurement

(°) Without adjustment

This equipment was connected with Temperature Probe;

- Model : -

- Serial No. : -

Dimension of probe

- Length : 112 mm.

- Diameter : 18 mm.

- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
15.0	15.002	15.0	-0.002	0.13	2.00
30.0	30.002	30.0	-0.002	0.13	2.00
45.0	45.003	45.0	-0.003	0.13	2.00

Remark : - UUC* = Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

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เอกสารไม่ควบคุม



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES
53/44 RATTANAKARIN ROAD SOI 18, SUANLIANG, SUANLIANG BANGKOK 10250
TEL:0-2717-3000-29 FAX:0-2719-9434



Cert.No.: 25CH1231
Page: 2 of 3

Certificate of Calibration

Cert.No.: 25CH1231
Page: 1 of 3

Equipment : pH Meter
Manufacturer : Horiba
Model : LAQUA-PH210
Serial No. : HASM0047
ID No. : UAEJFM.005/2563 (EPM pH.0563)
Condition As-Received : Used Item
Received Date : 24 February 2025
Calibration Date : 26 February 2025
Reference : 2502-0796HSC-2
Submitted by : United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomakul 41, Sukhumvit Road, Bangkok,
Phrakhanong, Bangkok 10260
Ambient Temperature : (25 ± 2.5) °C
Relative Humidity : (60 ± 15) %
Calibration Procedure : In-house method :
- CPACH5 by direct measurement with DC voltage standard and direct measurement with certified reference material (CRM)
- CPACH8 by comparison with temperature standard
Calibrated by : Waleek Srihean
Approved by :
Approved Signatory
() Chairat Wawwanjua
() Ponpan Palpim
(/) Saithip Meangmai
Issue Date : 27 February 2025

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Exp. Date
1) Document Process Calibrator	54030049	130RC116	25E2743	25 Aug 2026
2) Ref. Standard Thermometer	4982054	110RC044	25I706	03 July 2026

- This measurement result is traceable to SI through Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials

(The measurement results are traceable to SI through Hach Lange GmbH Ltd., Deutsche Akkreditierungsstelle, Accredited No. D-RM-15194-01-00)
(The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AP-1836)

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.006	CPA chem	1187328	18 Jan 2026
pH 7.000	Hach Lange GmbH	C03319	17 Oct 2027
pH 10.010	CPA chem	1187332	18 Jan 2027

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration Results

Function : mV Measurement

Performing standard curve by Document Process Calibrator at pH (4.7)(7.19)

Unit Under Calibration	Nominal Value		Standard Voltage Input		Actual Reading		Uncertainty of Measurement (mV)	Coverage factor k
	pH	mV	mV	pH	mV	pH		
pH Meter S/N.: HASM0047	4.00	177.48	177.3	4.01	0.058	2.00	0.058	2.00
	7.00	0.00	0.0	7.02	0.058	2.00	0.058	2.00
	7.00	0.00	0.0	7.02	0.058	2.00	0.058	2.00
	10.00	-177.48	-177.2	10.01	0.058	2.00	0.058	2.00

The Uncertainties are for a confidence probability of approximately 95 %

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Cert.No.: 25CH235
Page: 3 of 3

Calibration Results

Function: pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (k)	Coverage factor k
pH Electrode S/N: -	4.008	4.01	163.1	0.0079	2.00
	7.000	7.00	-10.4	0.0098	2.00
	7.000	7.00	-8.9	0.0095	2.00
	10.010	10.02	-177.9	0.0095	2.00

Function: Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model: -

- Serial No.: -

Dimension of probe

- Length: 103 mm.

- Diameter: 18 mm.

- Immersion Depth: 89 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
15.0	15.001	15.0	-0.001	0.13	2.00
30.0	30.001	30.0	-0.001	0.13	2.00
45.0	45.001	44.9	-0.101	0.13	2.00

Remark: - UUC* = Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES
504/4 PRITANAKARN ROAD 501 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL:0-2717-3000-29 FAX:0-2719-9484



Certificate of Calibration

Cert.No.: 25CH1473
Page: 1 of 3

Equipment: pH Meter
Manufacturer: Horiba
Model: LAQUA-PH210
Serial No.: HA1M0038
ID No.: UAE,EFM,012/2565(EFM,pH,02/85)
Condition As-Received: Used Item
Received Date: 24 December 2025
Calibration Date: 20 December 2025
Reference: 2512-0643WSC-2
Submitted by: United Analyst and Engineering Consultant Co.,Ltd.
3 Sol Udomsuk 41, Sukhumvit Road, Bangkok, Phrakhanong, Bangkok 10250

Ambient Temperature: 25 ± 2.5) °C
Relative Humidity: (50 ± 15) %
Calibration Procedure: In-house method:
- CP-CH5 by direct measurement with DC voltage standard and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with temperature standard

Calibrated by: Weisak Sirthean

Approved by: _____
Approved Signatory

() Chakrit Waeewongjue
() Ponpan Palpin
(✓) Sathip Maengmai

Issue Date: 29 December 2025

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written approval of the head of Corporate Services & Equipment Calibration and Testing Services.



Cert.No.: 25CH1473
Page: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Exp. Date
1) Document Process Calibrator	54030049	130RC116	25E2743	25 Aug 2026
2) Ref. Standard Thermometer	4962054	110RC044	25I705	09 July 2026

- This measurement result is traceable to SI through Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials

The measurement results are traceable to SI through Hoch Lange GmbH Ltd.,

Deutsche Akkreditierungsgesellschaft, Accredited No. D-RM-15184-01-00

The measurement results are traceable to SI through CPA chem Ltd.,

ANAB-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.007	CPA chem	1114384	12 June 2027
pH 6.999	Hoch Lange GmbH	C03273	13 May 2027
pH 10.010	CPA chem	1114385	08 June 2026

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration Results

Function: mV Measurement

Performing standard curve by Document Process Calibrator at pH (4,7)(7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (± mV)	Coverage factor k
	pH	mV	mV	pH		
pH Meter S/N: HA1M0038	4.00	177.48	177.5	4.01	0.058	2.00
	7.00	0.00	0.0	7.00	0.058	2.00
	7.00	0.00	0.0	7.00	0.058	2.00
	10.00	-177.48	-177.4	10.01	0.058	2.00

Calibration Results

Function: pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7)(7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (k)	Coverage factor k
pH Electrode S/N: -	4.007	4.01	165.6	0.0071	2.00
	6.999	7.00	-8.0	0.0095	2.00
	7.000	7.00	-8.5	0.0092	2.00
	10.010	10.02	-176.3	0.0096	2.00

Function: Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model: -

- Serial No.: -

Dimension of probe

- Length: 110 mm.

- Diameter: 18 mm.

- Immersion Depth: 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
15.0	15.001	15.0	-0.001	0.13	2.00
30.0	30.001	30.0	-0.001	0.13	2.00
45.0	45.001	45.1	0.098	0.13	2.00

Remark: - UUC* = Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

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