

ภาคผนวก ฉ

เอกสารสอบเทียบเครื่องมือตรวจวัด

รายการใบรับรองสอบเทียบ/ทวนสอบ เครื่องมือหลักประจำห้องปฏิบัติการวิเคราะห์ สำหรับตรวจวัดคุณภาพสิ่งแวดล้อม

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration*	Remark
เครื่องมือหลักสำหรับตรวจสอบคุณภาพน้ำ									
1	pH Meter	ความเป็นกรด-ด่าง อุณหภูมิ	EcoSence	pH100A JC04745	Technology Promotion Association (Thailand-Japan)	26CH315	18 Mar 26	17 Mar 27	-
2	BOD Incubator	บีโอดี	Arco	UR-1320 (UAE.WAO.018/2551)	Technology Promotion Association (Thailand-Japan)	2602300-002-01	12 Mar 26	11 Mar 27	-
3	Analytical Balance (Readability 0.01 mg)	สารแขวนลอย สารละลายได้ทั้งหมด	Mettler-Toledo	XSR205DU/ C210685394	United Analyst and Engineering Consultant Co., Ltd.	260311-2-BL001-26	12 Mar 26	12 Mar 27	-
4	Hot Air Oven		Memmert	UF55 / B212.0411	National Food Institute, Ministry of Industry, Thailand	2602300-001-01	11 Mar 26	10 Mar 27	-
5	Analytical Balance (Readability 0.1 mg)	ไขมันและน้ำมัน	Mettler-Toledo	XSR205DU C009071872	United Analyst and Engineering Consultant Co., Ltd.	260311-2-BL002-26	12 Mar 26	11 Mar 27	-
6	Digestor Unit	ทีเคเอ็น	FOSS TECATOR	2520 Auto 91794469	United Analyst and Engineering Consultant Co., Ltd.	2402957-001-01	13 Nov 25	12 Nov 26	-
7	Distillation Unit (Kjeldahl Method)		FOSS TECATOR	DT2520 / 91905060	FOSS South East Asia	15257	12 Feb 26	11 Feb 27	-
8	Incubator	โคลิฟอร์มทั้งหมด (Total Coliform Bacteria)	Binder	KB400 2020000015535	National Food Institute, Ministry of Industry, Thailand	2602303-006-01	11 Mar 26	10 Mar 27	-
9	Incubator	Legionella sp.	Memmert	IPP260 V615.0187	National Food Institute, Ministry of Industry, Thailand	2602303-001-01	11 Mar 26	10 Mar 27	-
10	Water Bath	โคลิฟอร์มทั้งหมด (Total Coliform Bacteria)	Memmert	WNE 14 / L421.0121	Technology Promotion Association (Thailand-Japan)	26TM443	16 Mar 26	15 Mar 27	-

รายการใบรับรองสอบเทียบ/ทวนสอบ เครื่องมือหลักประจำห้องปฏิบัติการวิเคราะห์ สำหรับตรวจวัดคุณภาพสิ่งแวดล้อม

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration*	Remark
เครื่องมือหลักสำหรับตรวจสอบคุณภาพน้ำ									
11	Analytical Balance	Legionella sp.	Ohaus	PX623 C236754745	United Analyst and Engineering Consultant Co., Ltd.	260311-4-BL005-26	16 Mar 26	15 Mar 27	-
12	Auto Clave		ALP	CL-40L / 808763	National Food Institute, Ministry of Industry, Thailand	2602303-007-01	11 Mar 26	10 Mar 27	-

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



Certificate of Calibration

Cert.No.: 26CH315
Page.: 1 of 3

Equipment : pH Meter
Manufacturer : EcoSense
Model : pH100A
Serial No. : JC04745
ID No. : UAE.EFM.059/2566(EFM.pH.02/66)
Condition As-Received: Used Item
Received Date : 17 March 2026
Calibration Date : 18 March 2026
Reference : 2603-0557WSC-2
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road, Bangchak,
Phrakhanong, 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-CH8 by comparison with temperature standard

Calibrated by : Warakorn Lemnattarakul

Approved by :
Approved Signatory

(✓) Chakrit Waewwanjua
() Ponpan Paipim
() Sathip Meangmai

Issue Date : 20 March 2026

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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Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	25E2743	25 Aug 2026
2) Ref. Standard Thermometer	4982054	110RC044	25I708	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 Lenge GmbH Ltd.,
Deutsche Akkreditierungsstelle, Accredited No.D-RM-15184-01-00
: The measurement results are traceable to SI through CPA chem Ltd.,
ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.008	CPA chem	1187328	18 Jan 2028
pH 7.000	Hach Lenge 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)(7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (± mV)	Coverage factor k
			mV	pH		
pH Meter S/N.: JC04745	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

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Cert.No.: 26CH315
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 (±)	Coverage factor k
pH Electrode S/N.: 240710SIA605377	4.008	4.01	166	0.0079	2.00
	7.000	7.00	-10	0.0092	2.00
	7.000	7.00	-10	0.0092	2.00
	10.010	10.01	-184	0.0085	2.00

Function : Temperature Measurement

(°) Without adjustment

This equipment was connected with Temperature Probe;

- Model :
- Serial No. : 240710SIA605377

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
15.0	15.002	14.9	-0.102	0.13	2.00
30.0	30.002	29.8	-0.202	0.13	2.00
45.0	45.002	44.7	-0.302	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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อุตสาหกรรมพัฒนาผลิตภัณฑ์อาหาร
ศูนย์บริการห้องปฏิบัติการอุตสาหกรรมอาหาร
Foundation for Industrial Development National Food Institute
Food Industrial Laboratory Service Center



Calibration Certificate

Substitute for Certificate No.: 2602300-002-01

Certificate No.: 2602300-002-02

Page : 1 of 2

Equipment: CHAMBER (Incubator)

Manufacturer: ARCO

Model: UR-1320

Serial No.: N/A

ID No.: UAE.WAO.018/2551

Order No.: 2602300

Operation No.: 2602300-002

Date of Receipt: 11 March 2026

Date of Calibration: 12 March 2026

Customer Name: UNITED ANALYST AND ENGINEERING CONSULTANT CO. LTD.

Address: 3 Soi Udomsuk 41, Sukhumvit Road,

Bangchak, Phrakhanong, Bangkok 10260

Metrological traceability:

1. Calibration Method:

- This instrument was calibrated by inserting 9 standard thermometers into its chamber, in accordance with W-TE-014, based on TLAS G-20-102-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
- The temperature scale used in this laboratory is the International Temperature Scale of 1990 (ITS-90).
- All data shown below are final values, and the initial data may be obtained upon request.

2. Reference Standard Instrument:

Instrument	Model/Type	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A RTD	MY59002902 CH101-109/ RTD101-109	2502797-002-01	3 May 2026	NATIONAL FOOD INSTITUTE

3. This 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 date and at the place of calibration shown.

Calibrated by Mr.Manas Somsak
Specialist

Date of Issue: 27 March 2026

Approved by (Mr.Pheraphat Tuantj)
Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team

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.

FCS-011 Revision 02 Date: 01-10-68

2008 เทคโนโลยีสารสนเทศ 36 เทคโนโลยีสารสนเทศ การพัฒนาผลิตภัณฑ์อาหาร
2008 เทคโนโลยีสารสนเทศ 36 เทคโนโลยีสารสนเทศ การพัฒนาผลิตภัณฑ์อาหาร
2008 เทคโนโลยีสารสนเทศ 36 เทคโนโลยีสารสนเทศ การพัฒนาผลิตภัณฑ์อาหาร
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2008 ตบะราษฎร์สุนทร 36 นุบะราษฎร์สุนทร แขวงบางยี่สิบ เขตบางพลี กรุงเทพมหานคร **เอกสารไม่ควบคุม**
2008 Soi 36, Arun Amarin Road, Bang Yi Khan Subdistrict, Bang Phlat District, Bangkok 10700, Thailand
Tel +66(0) 2422 8688 Fax +66(0) 2422 8545



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)

2008 ซอย 36, ถนนสุขุมวิท แขวงบางซื่อ เขตบางพลัด กรุงเทพมหานคร **เอกสารไม่ความลับ**
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เอกสารไม่ควบคุม

Certificate No.: 260311-2-BL002-26

Code No.: BL002-26

Page: 2 of 4

Equipment: Electronic Balance

Model: XSR205DU

Serial No.: C009071872

Max. Capacity: 81 g / 220 g

Calibration Date: March 12, 2026

Condition As-Received: In Condition

Manufacturer: Mettler Toledo

Readability: 0 to 81 (g): 0.01 mg > 80 to 200 (g): 0.1 mg

ID No.: UAE.WAO.012/2563

Condition of Equipment

Condition of This Result of Calibration:

1. Calibration Method: This instrument was calibrated by method UAE.CP.CAL.006 In-House Method based on UKAS Lab 14 : 2022

2. Reference Standards:

Reference Standard:	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Standard Weight Class E2 (OIML)	1 mg to 1 kg	C510641605	METTLER TOLEDO GmbH	C510641605	Mettler-Toledo GmbH	03-Mar-27
Standard Weight Class E2 (OIML)	1 mg to 1 kg	B749109122	AMARC	25-009359	Mettler-Toledo	21-Jan-27

Instrument	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Thermo-Hydro-Baro Meter	MHB-382SD	AK-46457	SUCCESS	SG-H-00992/68	Success Gateway	26-Nov-26
Thermo-Hydro-Baro Meter	MHB-382SD	AK-46457	TPA	25P4644	TPA	18-Dec-26

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 C510641605, SAS accreditation number SC5 0032

7. Through the reference standard laboratory of AMARC 25-009359, TSI accreditation number 0152

Calibration Result:

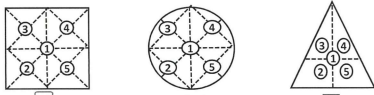
1. Repeatability of Reading:

Nominal Value (g)	Standard Deviation of Reading (g)
80	0.000008
200*	0.000045

2. Eccentric or off-center loading

A mass of 100 g was placed and moved to various positions 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	100.0000	100.0000	100.0000	100.0000	0.0000

เอกสารไม่ควบคุม

เอกสารไม่ควบคุม

Certificate No.: 260311-2-BL002-26

Code No.: BL002-26

Page: 4 of 4

Equipment: Electronic Balance

Model: XSR205DU

Serial No.: C009071872

Max. Capacity: 81 g / 220 g

Calibration Date: March 12, 2026

Manufacturer: Mettler Toledo

Readability: 0 to 81 (g): 0.01 mg > 80 to 200 (g): 0.1 mg

ID No.: UAE.WAO.012/2563

Calibration Result: (Continued)

Calibration Range: > 80 to 200 (g)

Calibration Adjustment: Internal Calibration

4. Error of indication from nominal or conventional mass value: (Range: > 80 to 200 (g); Resolution: 0.0001 g)

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty ($\pm$ mg)	Coverage Factor k
Unload	0.0000000	0.0000	0.0000	0.02	2.25
90	90.0000910	90.0000	0.0000	0.16	2.00
100	100.0000420	100.0000	0.0000	0.16	2.00
110	110.0000750	110.0000	0.0000	0.17	2.00
120	120.0000680	120.0000	0.0001	0.18	2.00
130	130.0001010	130.0000	0.0000	0.20	2.00
140	140.0000960	140.0003	0.0001	0.21	2.00
150	150.0000790	150.0003	0.0001	0.21	2.00
160	160.0001120	160.0003	0.0001	0.23	2.00
170	170.0001050	170.0003	-0.0002	0.24	2.00
200	200.0001460	200.0004	-0.0002	0.26	2.00

5. Effect of Tare test:

Tare Load (g)	Test Load (g)	Indication (g)	Correction (g)
100	20.000028	20.0000	0.0000
	40.000054	40.0002	-0.0001
	60.000070	60.0002	-0.0001
	80.000098	80.0002	-0.0001
	100.00042	100.0003	-0.0002

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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Certificate No.: 260311-2-BL002-26

Code No.: BL002-26

Page: 3 of 4

Equipment: Electronic Balance

Model: XSR205DU

Serial No.: C009071872

Max. Capacity: 81 g / 220 g

Calibration Date: March 12, 2026

Manufacturer: Mettler Toledo

Readability: 0 to 81 (g): 0.01 mg > 80 to 200 (g): 0.1 mg

ID No.: UAE.WAO.012/2563

Calibration Result: (Continued)

Calibration Range: 0 to 80 (g)

Calibration Adjustment: Internal Calibration

3. Error of indication from nominal or conventional mass value: (Range: 0 to 81 (g); Resolution: 0.00001 g)

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty ($\pm$ mg)	Coverage Factor k
Unload	0.0000000	0.00000	0.00000	0.015	2.25
0.001	0.0010020	0.00100	0.00000	0.015	2.23
0.005	0.0050025	0.00502	-0.00002	0.015	2.23
0.01	0.0100005	0.01002	-0.00002	0.015	2.23
0.05	0.0500003	0.05001	-0.00001	0.015	2.21
0.10	0.1000083	0.10002	-0.00001	0.015	2.20
0.50	0.5000121	0.50003	-0.00002	0.016	2.15
1	1.0000119	1.00001	0.00000	0.016	2.12
2	2.0000125	2.00003	-0.00001	0.017	2.09
5	5.0000146	5.00003	-0.00002	0.020	2.05
10	10.0000330	10.00005	-0.00002	0.023	2.00
20	20.000028	20.00008	-0.00005	0.033	2.00
30	30.000061	30.00010	-0.00004	0.051	2.00
40	40.000054	40.00009	-0.00004	0.063	2.00
50	50.000037	50.00008	-0.00005	0.064	2.00
60	60.000070	60.00011	-0.00004	0.081	2.00
80	80.000098	80.00011	-0.00001	0.11	2.00

แบบบันทึกผลการทวนสอบเตาย่อย (Heating Block/Digestion Unit)

รายละเอียดเครื่องมือที่ทวนสอบ

เครื่องมือ: Digital Ovens

หมายเลขเครื่อง: 91790060

หมายเลขใบสอบเทียบ: 4409057-001-01

หมายเลขประจำเครื่องบริษัท: UAE พาส. 0051 1553

ยี่ห้อ: Ross Tector

รุ่น: 9520 Digital

วันที่สอบเทียบ: 13/11/25

รายละเอียดเครื่องมือที่ใช้ทวนสอบ (Reference Standard) สภาวะที่ทวนสอบ

เครื่องมือ: Digital Thermometer, Thermocouple

หมายเลขเครื่อง: T.57995

หมายเลขประจำเครื่องบริษัท: UAE พาส. 0051 1553

หมายเลขเครื่อง (Probe): UAE พาส. 0051 1553

หมายเลขใบสอบเทียบ: 4500048-001-01

วันที่สอบเทียบ: 13/11/25

ผลการทวนสอบเตาย่อย Calibration Point 380 °C

เตาย่อยหมุมที่	อุณหภูมิที่อ่านได้จากเตาย่อย (°C)				อุณหภูมิที่อ่านได้จาก Reference Standard (°C)			
	Digestor Unit				UAE พาส. 0051 1553 ; Thermocouple			
	ครั้งที่ 1	ครั้งที่ 2	ค่าเฉลี่ย	คิดค่าแก้แล้ว	ครั้งที่ 1	ครั้งที่ 2	ค่าเฉลี่ย	คิดค่าแก้แล้ว
Calibration Point 380 °C								
Setting Point 380 °C								
A1	380	380	380	-	378.6	378.3	378.5	378.5
A2	381	381	381	-	380.7	380.3	380.5	380.5
A3	381	380	381	-	380.0	380.6	380.4	380.4
A4	382	382	382	-	381.4	381.7	381.3	381.3
B1	381	381	381	-	381.2	380.9	381.1	381.1
B2	380	381	381	-	380.6	380.8	380.7	380.7
B3	380	381	381	-	382.8	383.1	383.0	383.0
B4	381	381	381	-	380.7	381.9	381.0	381.0
C1	380	380	380	-	380.7	380.6	380.4	380.4
C2	380	381	381	-	379.7	379.3	379.5	379.5
C3	380	380	380	-	380.5	380.9	380.7	380.7
C4	381	381	381	-	380.7	381.3	381.0	381.0

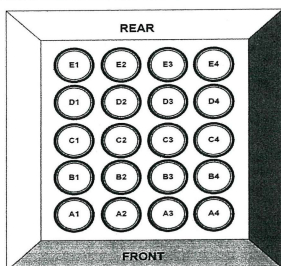
หมายเหตุ: เก็บใบแนบ พาส. 0-06

1/2

เอกสารไม่ควบคุม

ผลการทวนสอบ (ต่อ)

เตาเย็บหมักที่ Calibration Point: 380.0 °C Setting Point: 380.0 °C	อุณหภูมิที่อ่านได้จากเตาเย็บ (°C)				อุณหภูมิที่อ่านได้จาก Reference Standard (°C)			
	Digester Unit				UAE-WAS.005/1553 ; Thermocouple			
	ครั้งที่ 1	ครั้งที่ 2	ค่าเฉลี่ย	คิดค่าแก้แล้ว	ครั้งที่ 1	ครั้งที่ 2	ค่าเฉลี่ย	คิดค่าแก้แล้ว
								Correction 0.0
D1	380	381	380.5	-	380.8	381.3	381.0	381.0
D2	380	381	380.5	-	381.3	381.7	381.5	381.5
D3	381	381	381	-	381.9	381.5	381.7	381.7
D4	381	380	380.5	-	380.6	380.9	380.7	380.7
E1	381	381	381	-	381.4	380.8	381.1	381.1
E2	381	381	381	-	380.7	381.1	380.9	380.9
E3	380	381	380.5	-	380.1	380.9	380.5	380.5
E4	381	380	380.5	-	380.8	380.5	380.6	380.6
ค่าเฉลี่ย	-	-	-	-	-	-	-	-
ค่าส่วนเบี่ยงเบนมาตรฐาน	-	-	-	-	-	-	-	-
ค่าความผิดพลาด	พิจารณาจากความผิดพลาดแต่ละจุดให้อยู่ในช่วงเกณฑ์การยอมรับ							
เกณฑ์การยอมรับ	380 ± 5 °C							
ผลการทวนสอบ								



ผู้บันทึก:
วันที่: 13/11/25

ผู้ตรวจสอบ:
วันที่: 25/11/25

เอกสารไม่ควบคุม

2/2

หมายเหตุ : เก็บใบเพิ่ม WAS-005

Uae.netapp\Netapp_LAB\Lab-INSTRUMENT (11-2)แนบใบนี้เพื่อผลการทวนสอบ ส่วนกลางแนบใบนี้เพื่อผลการทวนสอบ Digester TKN (005_2555)



มูลนิธิสถาบันพัฒนาอุตสาหกรรม
ศูนย์บริการห้องปฏิบัติการอุตสาหกรรมอาหาร
Foundation for Industrial Development National Food Institute
Food Industrial Laboratory Service Center



Calibration Certificate

Certificate No.: 2602303-006-01
Page : 1 of 2

Equipment: CHAMBER (Incubator)
Manufacturer: BINDER
Model: KB 400
Serial No.: 2020000015535
ID No.: UAE.MIC.018/2564
Order No.: 2602303
Operation No.: 2602303-006
Date of Receipt: 11 March 2026
Date of Calibration: 11 March 2026

Customer Name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsak 41, Sukhumvit Road,
Bangchak, Prakhonong, Bangkok 10260

Metrological traceability:

- Calibration Method:
 - This instrument was calibrated by inserting 9 standard thermometers into its chamber, in accordance with W-TE-014, based on TLAS G-20-1/02-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
 - The temperature scale used in this laboratory is the International Temperature Scale of 1990 (ITS-90).
 - All data shown below are final values, and the initial data may be required.

2. Reference Standard Instrument:

Instrument	Model/Type	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	DAQ973A RTD	MY59008964 CH201-209/RTD201-209	2502244-001-01	29 March 2026	NATIONAL FOOD INSTITUTE

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

Calibrated by Mr.Nuttapol Niyomchat
Specialist
Date of Issue: 19 March 2026

Approved by (Mr.Pheraphat Tuanjit)
Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team

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.

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FOSS

Customer Service Report

Date: Feb 12, 2026
Job No.: 14590
Instrument: DT2520

FOSS South East Asia
3388 Sirinrat Building, 25th – 26th Floor, Unit No. 3388/90,
Rama IV Road, Klongton, Klongtoey, Bangkok, Thailand 10110

Report No.: 15257
Customer: UAE
Address: Bangkok
Serial: 9905060

Start Finish
Travel To Customer (Hrs)
Labour (Hrs)
Travel From Customer (Hrs)

Application		Special		Standard	
Distributor		Courtesy Visit		Installation	In House
Digital Service		PMA Approval Check		Quote	PM
Internal		Warranty		Repair	HCVisit
Training		Sales Support		Investigate	Others

PMA Type	Smartcare	Smartcare Pro	Fosscore
	Smartcare Advance	Fosscore Pro	N/A

Details of Work / Test	
- Visual Check	- PM
+ No Leak	-ok
+ No Damage	-ok
- Change PM kit x 1 Set	-ok
- Function Check	
+ Quick mode	
+ Set Temp / timer	-ok
+ Run	-ok
- heating	-ok
- Lift UP/down	-ok
- Clean x20 holes with dried head	
Instrument Ready for Use	OK
Not OK*	

Part No.	Batch	Description	Q'ty
60079730	29.09.2025	Fold PM kit, Digester 20 per, 12 unit	1

SIGNED FOSS		SIGNED CUSTOMER	
Name:		Name:	
Tel:		Tel:	
Email:		Email:	

*Remark:

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Please scan QR code



มูลนิธิสถาบันพัฒนาอุตสาหกรรม
ศูนย์บริการห้องปฏิบัติการอุตสาหกรรมอาหาร
Foundation for Industrial Development National Food Institute
Food Industrial Laboratory Service Center



Calibration Certificate

Certificate No.: 2602303-006-01
Page : 2 of 2

Calibration Condition:

Equipment: CHAMBER (Incubator)
UUC* Resolution: 0.1 °C
Condition of the item: Normal & Good
Without adjustment / As Found
Time of record 1 hour 9 minute / point
Place of Calibration: Microbiology Laboratory
UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Environment Conditions: Ambient Temperature (17.2 ± 1) °C
Relative Humidity (51.5 ± 4) %
Line Voltage (229 ± 2) V.

Calibration Results:

Table1 : Reporting of Temperature

Calibration Point (°C)	Std.#1	Std.#2	Std.#3	Std.#4	Std.#5	Std.#6	Std.#7	Std.#8	Std.#9	Measurement Uncertainty (±°C)
35.0	34.78	34.86	34.81	34.83	35.22	35.21	35.22	35.12	34.83	0.28

Table 2 : Reporting of Characterization Results

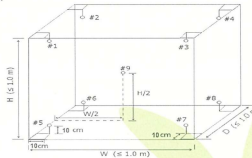
UUC* Setting (°C)	Max	UUC* Reading (°C)	Average	Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
35.0	35.0	35.0	35.0	0.034	0.39	0.52

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 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.

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

Fresh Air Damper	Open	Close	100% Fan speed
X			
Not Available			
Dimension of inside chamber and sensor installation location (cm)			
W x H x D	65	x 125	x 48
a x b x c	10	x 10	x 10



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 of Report -----

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Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2603-0427OC-2
Result of Calibration : (°) Without Adjustment
Function of UUC : Temperature Source

Cert. No.: 26TM443
Page : 3 of 3

Calibration point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Average* Standard Reading(°C)					Uncertainty (± °C)
			Position					
			1	2	3	4	5 (ref.)	
44.5	44.5	44.5	44.522	44.498	44.484	44.526	44.518	0.15

Calibration point (°C)	Uniformity (°C)	Stability (± °C)	Coverage Factor k
44.5	0.088	0.040	2

Average* : The average of 30 values in each position.

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.

Stability : One-half of the greatest maximum difference of measured temperature at any one probe.

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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United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260
Tel.0 2763 2828 Fax 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com



Certificate No.: 260311-4-BL005-26
Code No.: BL005-26
Page: 2 of 3

Equipment: Electronic Balance
Model: PX623
Serial No.: C236754745
Max. Capacity: 620 (g)
Calibration Date: March 16, 2026
Condition As-Received: In Condition
Manufacturer: OHLJAS
Readability: 0.001 (g)
ID No.: UAE.MIC.055/2565

Condition of Equipment:

Condition of This Result of Calibration:

1. Calibration Method: This instrument was calibrated by method UAE OF CAL 006 In-House Method based on UKAS Lab 14 : 2022

2. Reference Standards:

Reference Standard:	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Standard Weight Class E2 (OIML)	1 mg to 1 kg	C510641605	METTLER TOLEDO GmbH	C510641605	METTLER TOLEDO GmbH	3-Mar-27
Standard Weight Class E2 (OIML)	1 mg to 1 kg	B749109122	AMARC	25-009359	AMARC	21-Jan-27

Instrument	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Thermo-Hygro-Baro Meter	MHB-382SD	AK.46457	SUCCESS	SG-H-00992/68	Success Gateway	26-Nov-26
Thermo-Hygro-Baro Meter	MHB-382SD	AK.46457	TPA	25P4464	TPA	18-Dec-26

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 C510641605, SAS accreditation number SCS 0032

7. Through the reference standard laboratory of AMARC 25-009359, TSI accreditation number 0152

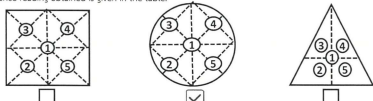
Calibration Result:

1. Repeatability of Reading:

Nominal Value (g)	Standard Deviation of Reading (g)
300	0.00055
600	0.00055

2. Eccentric or off-center loading

A mass of 200 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)
199.998	200.001	200.000	199.997	200.000	0.003



United Analyst and Engineering Consultant Co., Ltd.
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Tel.0 2763 2828 Fax 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com



Certificate of Calibration

Certificate No.: 260311-4-BL005-26

Code No.: BL005-26

Page: 1 of 3

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

Equipment: Electronic Balance
Manufacturer: OHLJAS
Model: PX623
Serial No.: C236754745
Asset No.: UAE.MIC.055/2565

Building : UAE number 3 Floor : 3 Room : 301

Received Date: March 16, 2026

Date of Calibration : March 16, 2026

Calibration Conditions:	Temperature	start	26.7 °C	end	27.4 °C
	Humidity	start	49.2 %	end	50.2 %
	Pressure	start	757.2 mmHg	end	756.2 mmHg

Calibrated by: Thanachat Chatpahal

Approved by: Suwit Chotnok

Signature: _____

Issued Date: March 18, 2026

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)



United Analyst and Engineering Consultant Co., Ltd.
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Certificate No.: 260311-4-BL005-26
Code No.: BL005-26
Page: 3 of 3

Equipment: Electronic Balance
Model: PX623
Serial No.: C236754745
Max. Capacity: 620 (g)
Calibration Date: March 16, 2026
Manufacturer: OHLJAS
Readability: 0.001 (g)
ID No.: UAE.MIC.055/2565

Calibration Result: (Continued)

Calibration Range: 0 to 600 (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 (± g)	Coverage Factor k
Unload	0.0000000	0.000	0.000	0.0011	2.09
1	1.0000119	1.000	0.000	0.0011	2.09
5	5.0000146	5.001	-0.001	0.0011	2.09
10	10.0000330	10.001	-0.001	0.0011	2.09
20	20.0000280	20.001	-0.001	0.0011	2.09
50	50.0000370	50.001	-0.001	0.0011	2.09
100	100.0000420	100.001	-0.001	0.0011	2.09
120	120.0000700	120.001	-0.001	0.0011	2.09
240	240.0002000	240.000	0.001	0.0012	2.08
360	360.0002580	360.000	0.001	0.0012	2.07
480	480.0003400	480.000	0.000	0.0013	2.05
600	599.9999800	599.998	0.002	0.0013	2.04

4. Effect of Tare test:

Tare Load (g)	Test Load (g)	Indication (g)	Correction (g)
300	30.000061	30.001	-0.001
	60.000070	60.000	0.000
	90.000091	89.999	0.001
	120.000137	119.999	0.001
	150.000146	149.998	0.002

Remark:

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

o---o-End-o---o

Calibration Certificate

Certificate No.: 2602303-007-01

Page : 1 of 2

Equipment: Autoclave
Manufacturer: ALP
Model: CL-40L
Serial No.: 808763
ID No.: UAE.MIC.026/2563
Order No.: 2602303
Operation No.: 2602303-007
Date of Receipt: 11 March 2026
Date of Calibration: 11 March 2026

Customer Name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road,
Bangchack, Prakhong, Bangkok 10260

Metrological traceability:

1. Calibration Method:

- This instrument was calibrated by inserting 3 standard data loggers with RTDs into its autoclave, in accordance with W-TE-018.
based on BS 2646-1:2021, Autoclaves for sterilization in laboratories Part 1: Design, construction, safety and performance - specification.
- The temperature scale used in this laboratory is the International Temperature Scale of 1990 (ITS-90).
- All data shown below are final values, and the initial data may be obtained upon request.

2. Reference Standard Instrument:

Instrument	Model/Type	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with RTD (Data Logger)	HiTemp140-PT	S33753	2502245-002-01	22 March 2026	NATIONAL FOOD INSTITUTE
	HiTemp140	R25602	2601300-004-01	10 January 2027	NATIONAL FOOD INSTITUTE
	PRTemp140	R38546	2601300-003-01	10 January 2027	NATIONAL FOOD INSTITUTE

3. This 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 date and at the place of calibration shown.

Calibrated by Mr.Nuttapol Niyomchat
Specialist
Date of Issue: 19 March 2026

Approved by (Mr.Pheraphat Tuanjit)
Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team

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-CS-009 Revision: 02 Date: 01-10-68

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Calibration Certificate

Certificate No.: 2602303-007-01

Page : 2 of 2

Calibration Condition:

Equipment: Autoclave
Resolution: 0.1 °C
Condition of the item: Normal & Good
Without adjustment / As Found
- Setting program function sterilization STERILIZE/NORMAL
- Time of sterilizer 15 Minute at 115.0, 121.0 °C

Place of Calibration: Room 301
Environment Conditions: Ambient Temperature (26.0 ± 1) °C
Relative Humidity (47.5 ± 3) %
Line Voltage (228.5 ± 4) V.

Calibration Results:

Table1 : Reporting of Temperature

Calibration Point (°C)	Std.# 1	Measured Temperature (°C) @ Sensor No.	Std.# 2 (REF)	Std.# 3	Measurement Uncertainty (±°C)
115.0	115.29	115.33		115.37	0.64
121.0	121.17	121.18		121.06	0.64

Table 2 : Reporting of Characterization Results

UUC* Setting (°C)	Max	UUC* Reading (°C)	Min	Average	MPa	Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
115.0	115.1	114.9	115.0	115.0	0.08	0.23	0.53	0.51
121.0	121.1	120.9	121.0	121.0	0.12	0.24	0.67	0.67

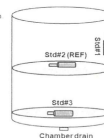
Note

- UUC* : Unit Under Calibration
- The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity)"
- 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.

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

Standard at position

- Std #1 - Attached to the load temperature probe, within 20 mm.
- Std #2 (REF) - In the upper half of the chamber.
- Std #3 - In the chamber drain, within 100 mm.



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 of Report -----

F-CS-009 Revision: 02 Date: 01-10-68

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