

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 | Horiba | LAQUA-PH210 HA0F0026 | Technology Promotion Association (Thailand-Japan) | 25CH22 | 9 Jan 25 | 8 Jan 26 | - |
| 2 | BOD Incubator | บีโอดี | Arco | UC4-1320 / (UAE.WAO.015/2561) | Technology Promotion Association (Thailand-Japan) | 25TM205 | 8 Feb 25 | 7 Feb 26 | - |
| 3 | Analytical Balance (Readability 0.01 mg) | สารแขวนลอย สารละลายได้ทั้งหมด | Mettler-Toledo | XSR205DU / C009071872 | National Food Institute, Ministry of Industry, Thailand | 2502226-001-01 | 20 Mar 25 | 19 Mar 26 | - |
| 4 | Hot Air Oven | | Memmert | UF55 / B216.1666 | National Food Institute, Ministry of Industry, Thailand | 2500116-001-01 | 8 Oct 24 | 7 Oct 25 | - |
| 5 | Analytical Balance (Readability 0.1 mg) | ไขมันและน้ำมัน | Mettler-Toledo | XSR204 / C117635043 | United Analyst and Engineering Consultant Co., Ltd. | 250422-1-BL001-25 | 23 Apr 25 | 22 Apr 26 | - |
| 6 | Digester Unit | ทีเคเอ็น | FOSS TECATOR | DT2520 / 91905060 | National Food Institute, Ministry of Industry, Thailand | 2501440-001-01 | 27 Jan 25 | 26 Jan 26 | - |
| 7 | Distillation Unit (Kjeldahl Method) | | FOSS TECATOR | DT2520 / 91794469 | FOSS South East Asia | 13320 | 27 Jan 25 | 26 Jan 26 | - |
| 8 | Incubator | โคลิฟอร์มทั้งหมด (Total Coliform Bacteria) | Memmert | IPP 260 / V618.0033 | National Food Institute, Ministry of Industry, Thailand | 2502229-003-01 | 19 Mar 25 | 18 Mar 26 | - |
| 9 | Incubator | Legionella sp. | Binder | KB400 / 20200000015535 | National Food Institute, Ministry of Industry, Thailand | 2502229-006-01 | 19 Mar 25 | 18 Mar 26 | - |
| 10 | Water Bath | โคลิฟอร์มทั้งหมด (Total Coliform Bacteria) | Memmert | WNE 14 / L421.0121 | Technology Promotion Association (Thailand-Japan) | 25TM502 | 19 Mar 25 | 18 Mar 26 | - |

รายการใบรับรองสอบเทียบ/ทวนสอบ เครื่องมือหลักประจำห้องปฏิบัติการวิเคราะห์ สำหรับตรวจวัดคุณภาพสิ่งแวดล้อม


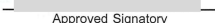
| No. | Instrument/Equipment | Parameter | Manufacturer | Model/Serial No. | Calibrator | Certification No. | Date of Calibration | Due date of Calibration* | Remark |
|--------------------------------------|----------------------|----------------|--------------|----------------------|--|-------------------|---------------------|--------------------------|--------|
| เครื่องมือหลักสำหรับตรวจสอบคุณภาพน้ำ | | | | | | | | | |
| 11 | Analytical Balance | Legionella sp. | OHAUS | PX623/ C236754745 | National Food Institute, Ministry of Industry, Thailand | 2502227-001-01 | 19 Mar 25 | 18 Mar 26 | - |
| 12 | Auto Clave | | ALP | CL-40L / 808763 | National Food Institute, Ministry of Industry, Thailand | 2502229-007-01 | 19 Mar 25 | 18 Mar 26 | - |

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



Certificate of Calibration

Cert. No.: 25TM205
Page : 1 of 3

Equipment : BOD Incubator
Manufacturer : Arco
Model : UC4-1320
Serial No. : 13URC4S013201
ID No. : UAE.WAO.015/2561
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road
Bangchak, Phrakhanong
Bangkok 10260
Location : Lab. Floor 2
Received Order : 08 February 2025
Calibration Date : 08 February 2025
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V
Calibrated by : 
Approved by : 
() Chakrit Waewwanjua
() Suwit Imjai
(✓) Kunchit Promprat
Issue Date : 21 February 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.

เอกสารไม่ควบคุม



Equipment : BOD Incubator
Condition As-Received : Used Item
Reference : 2502-0166OC-1
Procedure Used :-

Cert. No.: 25TM205
Page : 2 of 3

Calibration were conducted using calibration procedure CP-OT02 based on TLAS G-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 | MY57013823 | 24LM71 | TPA | 12 May 2025 |

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

3. This certification is traceable to the International System of Unit.

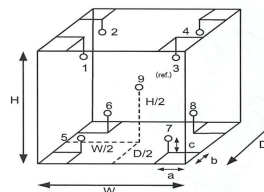
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration : (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Not Available

| Environment during calibration | | |
|--------------------------------|-----------|----------|
| | Beginning | Finished |
| Temp. (°C) | 26 | 25 |
| REL.Humid. (%) | 49 | 52 |
| AC Supply (Volt) | 221 | 220 |



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 | 21-17RTD-01 |
| 2 | 21-17RTD-02 |
| 3 | 17RTD-03 |
| 4 | 24-17RTD-04 |
| 5 | 17RTD-05 |
| 6 | 17RTD-06 |
| 7 | 17RTD-07 |
| 8 | 23-17RTD-08 |
| 9 (ref.) | 23-17RTD-09 |

เอกสารไม่ควบคุม



Equipment : BOD Incubator
Condition As-Received : Used Item
Reference : 2502-0166OC-1
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Not Available

Cert. No.: 25TM205
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 | 19.9 | 0.36 | 0.56 | 0.99 | 2 |

| Calibration Point (°C) | Measured Temperature (°C) | | | | | | | | | Uncertainty (± °C) |
|--------------------------|-----------------------------|--------|--------|--------|--------|--------|--------|--------|----------|----------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 (ref.) | |
| 20.0 | 19.841 | 19.714 | 20.110 | 19.862 | 19.747 | 19.710 | 19.676 | 19.789 | 19.695 | 0.54 |

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



อุตสาหกรรมพัฒนาผลิตภัณฑ์อาหาร
ศูนย์บริการข้อมูลวิชาการอุตสาหกรรมอาหาร
Foundation for Industrial Development National Food Institute
Food Industrial Laboratory Service Center



Calibration Certificate

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

Page 1 of 4

Equipment: Electronic Balance

Manufacturer: METTLER TOLEDO

Model: XSR205DU

Serial No.: C009071872

ID No.: UAE.WAO.012/2563

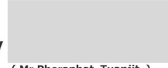
Order No.: 2502226

Operation No.: 2502226-001

Date of Receipt: 19 March 2025

Date of Calibration: 20 March 2025

Calibrated by 
Scientist

Approved by 
(Mr.Pheraphat Tuanjit)
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.

E-CS-009 Revision: 01 Date: 20-04-65

2008 ตราสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรมแห่งประเทศไทย
2008 ตรา 35, Avin Amarn Road, Bang Yi Khan Subdistrict, Bang Phlat District, Bangkok 10700, Thailand
Tel : +66(0) 2422 8688 Fax : +66(0) 2422 8545

เอกสารไม่ควบคุม



Calibration Report

Certificate No.: 2502226-001-01
Equipment: Electronic Balance
Manufacturer: METTLER TOLEDO
Model: XSR205DU
Resolution: 0.00001 g / 0.0001 g
Serial No.: C009071872
ID No.: UAE.WAO.012/2563
Capacity: 82 g / 220 g

Date of Calibration: 20 March 2025 Page 2 of 4

Environment Condition: Ambient Temperature: 21.2 ± 0.6 °C Relative Humidity: 48 ± 3.5 %

Place of Calibration: 208 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 W-MA-001 In-House Method based on UKAS Lab 14 : 2019

2. Reference Standards:

| Reference Standard | Model | Serial No. | Calibrated By | Certificate No. | Due Date |
|--------------------------|-------------|------------|---------------|-----------------|---------------|
| Standard Weight Class E2 | 1mg to 200g | BS05567572 | TCS | M24041005 | 19 April 2025 |

| Instrument | Model | Serial No. | Calibrated By | Certificate No. | Due Date |
|--------------------|--------|----------------|----------------|-----------------|------------------|
| Thermo-Hygro Meter | 608-H1 | NFI.BTH 017/23 | Quality Reborn | QR25-0542 | 10 February 2026 |

3. This certificate 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:

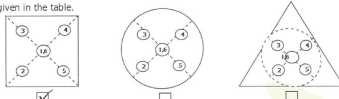
1. Repeatability of Reading:

| Nominal Value (g) | Standard Deviation of Reading (g) |
|---------------------|-------------------------------------|
| 40 | 0.0000052 |
| 80 | 0.0000042 |
| 100 | 0.0000000 |
| 200 | 0.0000000 |

2. Off-Center Error:

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) | 6 (g) | (Maximum Difference) (g) |
|----------|----------|----------|----------|----------|----------|----------------------------|
| 100.0001 | 100.0001 | 100.0001 | 100.0001 | 100.0001 | 100.0002 | 0.0001 |

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

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Calibration Report

Certificate No.: 2502226-001-01
Equipment: Electronic Balance
Manufacturer: METTLER TOLEDO
Model: XSR205DU
Resolution: 0.00001 g / 0.0001 g
Serial No.: C009071872
ID No.: UAE.WAO.012/2563
Capacity: 82 g / 220 g

Date of Calibration: 20 March 2025 Page 4 of 4

Calibration Results: (Continued)

Calibration Range: >80-200 g

Calibration Adjustment: Internal Calibration

3. Departure from Nominal Value: (Range: >80 - 200 g ; Resolution: 0.0001 g)

| Nominal Value (g) | Standard Value (g) | Average Reading (g) | Correction (g) | Uncertainty (± g) | Coverage Factor k |
|---------------------|----------------------|-----------------------|------------------|---------------------|-------------------|
| 90 | 90.00010 | 90.0002 | -0.0001 | 0.00015 | 2.00 |
| 100 | 100.00006 | 100.0001 | 0.0000 | 0.00016 | 2.00 |
| 110 | 110.00007 | 110.0001 | 0.0000 | 0.00017 | 2.00 |
| 120 | 120.00009 | 120.0002 | -0.0001 | 0.00018 | 2.00 |
| 130 | 130.00010 | 130.0002 | -0.0001 | 0.00019 | 2.00 |
| 140 | 140.00013 | 140.0002 | -0.0001 | 0.00019 | 2.00 |
| 150 | 150.00009 | 150.0002 | -0.0001 | 0.00021 | 2.00 |
| 160 | 160.00010 | 160.0002 | -0.0001 | 0.00022 | 2.00 |
| 170 | 170.00012 | 170.0002 | -0.0001 | 0.00023 | 2.00 |
| 200 | 200.00013 | 200.0002 | -0.0001 | 0.00028 | 2.00 |

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 %.

----- End -----

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

เอกสารไม่ควบคุม



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Calibration Report

Certificate No.: 2502226-001-01
Equipment: Electronic Balance
Manufacturer: METTLER TOLEDO
Model: XSR205DU
Resolution: 0.00001 g / 0.0001 g
Serial No.: C009071872
ID No.: UAE.WAO.012/2563
Capacity: 82 g / 220 g

Date of Calibration: 20 March 2025 Page 3 of 4

Calibration Results: (Continued)

Calibration Range: 0-80 g

Calibration Adjustment: Internal Calibration

3. Departure from Nominal Value: (Range: 0 - 82 g ; Resolution: 0.00001 g)

| Nominal Value (g) | Standard Value (g) | Average Reading (g) | Correction (g) | Uncertainty (± g) | Coverage Factor k |
|---------------------|----------------------|-----------------------|------------------|---------------------|-------------------|
| Unload | 0.000000 | 0.00000 | 0.00000 | 0.0000089 | 2.00 |
| 0.001 | 0.001003 | 0.00100 | 0.00000 | 0.0000092 | 2.00 |
| 0.005 | 0.005002 | 0.00500 | 0.00000 | 0.0000094 | 2.00 |
| 0.01 | 0.010003 | 0.01000 | 0.00000 | 0.0000091 | 2.00 |
| 0.05 | 0.049996 | 0.05000 | 0.00000 | 0.0000098 | 2.00 |
| 0.1 | 0.100011 | 0.10000 | 0.00001 | 0.000011 | 2.00 |
| 0.5 | 0.500016 | 0.50000 | 0.00002 | 0.000014 | 2.00 |
| 1 | 1.000003 | 1.00001 | -0.00001 | 0.000016 | 2.00 |
| 2 | 2.000023 | 2.00005 | -0.00003 | 0.000017 | 2.00 |
| 5 | 5.000015 | 5.00005 | -0.00003 | 0.000021 | 2.00 |
| 10 | 10.000009 | 10.00005 | -0.00004 | 0.000026 | 2.00 |
| 20 | 20.000030 | 20.00012 | -0.00009 | 0.000037 | 2.00 |
| 30 | 30.000039 | 30.00012 | -0.00008 | 0.000050 | 2.00 |
| 50 | 50.000028 | 50.00014 | -0.00011 | 0.000068 | 2.00 |
| 80 | 80.000067 | 80.00020 | -0.00013 | 0.00011 | 2.00 |

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

เอกสารไม่ควบคุม



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Calibration Certificate

Certificate No.: 2500116-001-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road, Bangchack, Prakhonong, Bangkok 10260

Equipment: CHAMBER (Hot Air Oven)

Manufacturer: MEMMERT

Model: UF55

Serial No.: B216.1666

ID No.: UAE.WAO.027/2559

Order No.: 2500116

Operation No.: 2500116-001

Date of Receipt: 8 October 2024

Date of Calibration: 8 October 2024

Calibrated by
Scientist

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

Date of Issue: 15 October 2024

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.

F-CS-009 Revision: 01 Date: 20-04-65

เอกสารไม่ควบคุม



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Calibration Report

Certificate No.: 2500116-001-01
Equipment: CHAMBER (Hot Air Oven)
Model: UF55 Serial No.: B216.1666
Resolution: 0.1 °C ID No.: UAE.WAO.027/2559
Manufacturer: MEMMERT
Date of Calibration: 8 October 2024 Page 2 of 3

Location: Laboratory, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Environment Condition: Ambient Temperature (30.3 ± 1) °C
Relative Humidity (55 ± 1) %
Line Voltage (230 ± 3) Volt

Condition of this results of Calibration:

- This instrument was calibrated by insert 9 standard thermometer into its chamber and calibration according to 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 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 | 34972A | MY57003188 | TE 670486-01 | 8 June 2025 | NATIONAL FOOD INSTITUTE |
| | RTD | CH#201-209/ RTD#201-209 | | | |

- 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 104.0,140.0 and 180.0 °C |
| Fresh air Damper | - | Open Position - | |
| | X | Close Fan 40% | |
| | - | Not Available | |

- Result of Calibration : ☒ Without adjustment ☐ After adjustment

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

2008 บ้างสำนักงาน 36 หมู่บ้านสุขุมวิท แขวงบางนา เขตบางนา กรุงเทพมหานคร 10260
2008 36 หมู่บ้านสุขุมวิท แขวงบางนา เขตบางนา กรุงเทพมหานคร 10260
Tel +66(0) 2422 8568 Fax +66(0) 2422 8545



Calibration Report

Certificate No.: 2500116-001-01
Equipment: CHAMBER (Hot Air Oven)
Model: UF55 Serial No.: B216.1666
Resolution: 0.1 °C ID No.: UAE.WAO.027/2559
Manufacturer: MEMMERT
Date of Calibration: 8 October 2024 Page 3 of 3

Calibration point: 104.0,140.0 and 180.0 °C

Calibration result:

| Calibration Condition | Temperature (°C) | Relative Humidity (%) | Line Voltage (Volt) |
|-----------------------|------------------|-----------------------|---------------------|
| MIN | 29.3 | 54 | 227.0 |
| MAX | 31.2 | 56 | 232.0 |

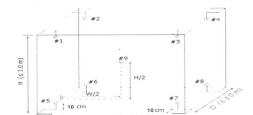


Table 1 : Reporting of Temperature

| Calibration point (°C) | Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF) | | | | | | | | | Uncertainty ± (°C) |
|------------------------|---|--------|--------|--------|--------|--------|--------|--------|--------|--------------------|
| | # 1 | # 2 | # 3 | # 4 | # 5 | # 6 | # 7 | # 8 | # 9 | |
| 104.0 | 103.89 | 103.66 | 103.88 | 103.89 | 104.40 | 103.98 | 103.70 | 104.10 | 104.15 | 0.53 |
| 140.0 | 139.85 | 139.53 | 139.87 | 139.88 | 140.67 | 140.00 | 139.60 | 140.25 | 140.23 | 0.73 |
| 180.0 | 179.63 | 179.22 | 179.71 | 179.76 | 181.03 | 180.06 | 179.41 | 180.87 | 180.39 | 0.90 |

Table 2 : Reporting of Characterization Result

| UUC* Setting (°C) | UUC* Reading (°C) | | | Stability ± (°C) | Uniformity (°C) | Overall Variation |
|-------------------|-------------------|-------|---------|------------------|-----------------|-------------------|
| | MIN | MAX | Average | | | |
| 104.0 | 104.0 | 104.0 | 104.0 | 0.15 | 0.49 | 0.88 |
| 140.0 | 140.0 | 140.0 | 140.0 | 0.13 | 0.71 | 1.2 |
| 180.0 | 180.0 | 180.0 | 180.0 | 0.13 | 1.2 | 1.9 |

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 of confidence of approximately 95 %.

----- End -----

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

2008 บ้างสำนักงาน 36 หมู่บ้านสุขุมวิท แขวงบางนา เขตบางนา กรุงเทพมหานคร 10260
2008 36 หมู่บ้านสุขุมวิท แขวงบางนา เขตบางนา กรุงเทพมหานคร 10260
Tel +66(0) 2422 8568 Fax +66(0) 2422 8545



Certificate of Calibration

Certificate No.: 250422-1-BL001-25

Code No.: BL001-25

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: Mettler Toledo
Model: XSR204
Serial No.: C117635043
Asset No.: UAE.WAS.012/2564
Building: N/A **Floor:** 1 **Room:** 107

Received Date: April 22, 2025
Date of Calibration: April 23, 2025
Calibration Conditions: Temperature 22.9 °C to 23.3 °C
Humidity 52.0 % to 56.5 %
Pressure 759.7 mmHg to 759.9 mmHg

Calibrated by: Sakkarin Srirahang

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-BL001-25

Code No.: BL001-25

Page: 2 of 3

Equipment: Electronic Balance
Model: XSR204
Serial No.: C117635043
Max. Capacity: 220 g
Calibration Date: April 23, 2025
Condition As-Received: In Condition
Manufacturer: Mettler Toledo
Readability: 0.0001 g
ID No.: UAE.WAS.012/2564

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 | 8749109122 | AMARC | 25-009359 | Mettler-Toledo | 21-Jan-27 |
| Standard Weight Class F1 (OIML) | 1 mg to 200 g | 11119512 | AMARC | 24-013840 | Mettler-Toledo | 04-Feb-26 |
| Instrument | Model | Serial No. | Calibrated By | Certificate No. | Traceability | Due Date |
| Thermo-Hygro-Baro Meter | MHB-3825D | AK.46457 | SUCCESS | SG-H-00997/67 | Success Gateway | 21-Nov-25 |
| Thermo-Hygro-Baro Meter | MHB-3825D | AK.46457 | TPA | 25P795 | TPA | 25-Feb-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 show on date and place of calibration only.

6. Through the reference standard laboratory of AMARC 25-009359 Calibration 0152

Calibration Result:

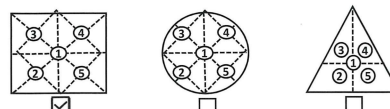
1. Repeatability of Reading:

| Nominal Value (g) | Standard Deviation of Reading (g) |
|-------------------|-----------------------------------|
| 200* | 0.000045 |

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) |
|----------|----------|----------|----------|----------|------------------------|
| 100.0004 | 100.0004 | 100.0002 | 100.0003 | 100.0006 | 0.0002 |

เอกสารไม่ควบคุม

Certificate No.: 250422-1-BL001-25

Code No.: BL001-25

Page: 3 of 3

Equipment: Electronic Balance
Model: XSR204
Serial No.: C117635043
Max. Capacity: 220 g
Calibration Date: April 23, 2025
Manufacturer: Mettler Toledo
Readability: 0.0001 g
ID No.: UAE.WAS.012/2564

Calibration Result: (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 (\pm mg) | Coverage Factor <i>k</i> |
|----------------------|------------------------|-------------------|-------------------|----------------------------|-----------------------------|
| Unload | - | 0.0000 | 0.0000 | 0.10 | 2.05 |
| 1 | 1.0000105 | 1.0000 | 0.0000 | 0.10 | 2.05 |
| 5 | 5.000007 | 5.0000 | 0.0000 | 0.10 | 2.05 |
| 10 | 10.00001 | 10.0000 | 0.0000 | 0.11 | 2.04 |
| 20 | 20.000041 | 20.0000 | 0.0000 | 0.11 | 2.04 |
| 40 | 40.000076 | 40.0001 | 0.0000 | 0.14 | 2.00 |
| 50 | 50.000056 | 50.0001 | -0.0001 | 0.13 | 2.00 |
| 60 | 60.000066 | 60.0002 | -0.0001 | 0.15 | 2.00 |
| 80 | 80.000107 | 80.0003 | -0.0002 | 0.18 | 2.00 |
| 100 | 100.000109 | 100.0004 | -0.0003 | 0.17 | 2.00 |
| 120 | 120.00015 | 120.0004 | -0.0003 | 0.21 | 2.00 |
| 160 | 160.000175 | 160.0006 | -0.0004 | 0.26 | 2.00 |
| 200 | 200.000179 | 200.0008 | -0.0006 | 0.30 | 2.00 |

4. Effect of Tare test:

| Tare Load (g) | Test Load (g) | Indication (g) | Correction (g) |
|------------------|------------------|-------------------|-------------------|
| 100 | 20.000041 | 20.0001 | -0.0001 |
| | 40.000076 | 40.0003 | -0.0002 |
| | 60.000066 | 60.0003 | -0.0002 |
| | 80.000107 | 80.0004 | -0.0003 |
| | 100.000168 | 100.0004 | -0.0002 |

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---

เอกสารไม่ควบคุม

Verification Certificate

Certificate No.: 2501440-001-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road,
Bangchack, Prakhonong, Bangkok 10260

Page 1 of 4

Equipment: Digestion Unit (Heating Block)
Manufacturer: FOSS
Model: Tecator Digestor 2520
Serial No.: 91905060
ID No.: UAE.WAS.030/2566
Order No.: 2501440
Operation No.: 2501440-001
Date of Receipt: 27 January 2025
Date of Calibration: 27 January 2025

Calibrated by Scientist Approved by (Mr.Pheraphat Tuanjit)
Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team
Date of Issue: 29 January 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.

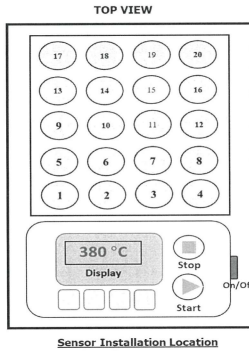
F-CS-009 Revision: 01 Date: 20-04-65

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Verification Report

Certificate No.: 2501440-001-01
Equipment: Digestion Unit (Heating Block)
Model: Tecator Digestor ; Serial No.: 91905060
Resolution: 1 °C ID No.: UAE.WAS.030/2566
Manufacturer: FOSS
Date of Calibration: 27 January 2025
Calibration point: 380 °C
Calibration result: Continued

Figure 1. Location of Reference Standard and Block Diagram of Digestion Unit



----- End -----

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

เอกสารไม่ควบคุม



nfi.or.th

Calibration Certificate

Certificate No.: 2502229-003-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road,
Bangchack, Prakanong, Bangkok 10260

Page 1 of 3

Equipment: CHAMBER (Incubator)
Manufacturer: MEMMERT
Model: IPP260
Serial No.: V618.0033
ID No.: UAE.MIC.021/2561
Order No.: 2502229
Operation No.: 2502229-003
Date of Receipt: 19 March 2025
Date of Calibration: 19 March 2025

Calibrated by: [Signature] Approved by: [Signature]
Scientist Manager, Division of Calibration Laboratory
Date of Issue: 25 March 2025 Responsible for the Technical Management Team

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.

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

เอกสารไม่ควบคุม



nfi.or.th

Customer Service Report

| | | | | | |
|--------------------------|--------------|--------------|----------|----------------------------|---|
| Date: | Jun 27, 2025 | Report No.: | 13320 | | |
| Job No.: | 11676 | Customer: | UAE | | |
| Instrument: | DT2520 | Address: | Bangkok | | |
| | | Serial: | 91794469 | | |
| Travel To Customer (Hrs) | | Labour (Hrs) | | Travel From Customer (Hrs) | |
| Start | - | 13-00 | 2 | | - |
| Finish | - | 15-00 | | | - |

| Application | | Special | | Standard | |
|-----------------|---|----------------|---|--------------|---|
| Distributor | x | Courtesy Visit | x | Installation | x |
| Digital Service | x | PMA Onboarding | x | Quote | x |
| Internal | x | Warranty | x | Repair | x |
| Investigate | x | Sales Support | x | Remote | x |

| PMA Type | | Smartcare | Smartcare Pro | Fosscore |
|----------|--|-------------------|---------------|----------|
| | | x | x | x |
| | | Smartcare Advance | Fosscore Pro | N/A |
| | | x | x | x |

| Details of Work / Test | |
|-------------------------------|-----|
| - PM - | |
| - Visual Check - | |
| - No damage | -ok |
| - No corrosion | -ok |
| - Function Check - | |
| - Set Temp / Time | |
| - Set Control | |
| - Change unit °C / °F | |
| - Run / heating 370°C → 420°C | |
| * Test Auto 1/14 (LS) | |

| | | | | |
|--------------------------|----|---|---------|---|
| Instrument Ready for Use | OK | x | Not OK* | x |
|--------------------------|----|---|---------|---|

| Part No. | Batch | Description | Qty |
|----------|-------|--|-----|
| 60070730 | | FOSS PM kit, Digestor R20 per, 12 months | 1 |

| | | | |
|-------------|--|-----------------|--|
| Signed FOSS | | Signed Customer | |
| Name | | Name | |

| | | | |
|--------|--|-------------------|--|
| Email: | | Customer Contact: | |
|--------|--|-------------------|--|

*Remark: เอกสารไม่ควบคุม

Calibration Report

Certificate No.: 2502229-003-01
Equipment: CHAMBER (Incubator)
Model: IPP260 Serial No.: V618.0033
Resolution: 0.1 °C ID No.: UAE.MIC.021/2561
Manufacturer: MEMMERT
Date of Calibration: 19 March 2025

Page 2 of 3

Location: 302, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Environment Condition:
Ambient Temperature (23.0 ± 1) °C
Relative Humidity (59 ± 1) %
Line Voltage (223 ± 3) Volt

Condition of this results of Calibration:

- This instrument was calibrated by insert 9 standard thermometer into its chamber and calibration according to 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 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 | MYS7003188 | TE 670486-01 | 8 June 2025 | NATIONAL FOOD INSTITUTE |
| | RTD | CH#301-309/RTD#301-309 | | | |

- 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 22.0 and 25.0 °C

| | | | | |
|------------------|---|---------------|----------|---|
| Fresh air Damper | - | Open | Position | - |
| | X | Close | Fan | - |
| | - | Not Available | | |

- Result of Calibration : X Without adjustment After adjustment

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

เอกสารไม่ควบคุม



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Calibration Report

Certificate No.: 2502229-003-01
Equipment: CHAMBER (Incubator)
Model: JPP260 Serial No.: V618.0033
Resolution: 0.1 °C ID No.: UAE.MIC.021/2561
Manufacturer: MEMMERT

Date of Calibration: 19 March 2025

Calibration point: 22.0 and 25.0 °C

Calibration result:

| Calibration Condition | Temperature (°C) | Relative Humidity (%) | Line Voltage (Volt) |
|-----------------------|------------------|-----------------------|---------------------|
| MIN | 22.7 | 58 | 220.0 |
| MAX | 23.3 | 60 | 225.0 |

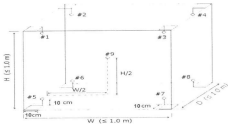


Table 1 : Reporting of Temperature

| Calibration point (°C) | Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF) | | | | | | | | | Uncertainty ± (°C) |
|------------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|--------------------|
| | # 1 | # 2 | # 3 | # 4 | # 5 | # 6 | # 7 | # 8 | # 9 | |
| 22.0 | 22.18 | 22.18 | 22.16 | 22.19 | 21.94 | 21.95 | 21.96 | 21.98 | 22.08 | 0.27 |
| 25.0 | 25.51 | 25.32 | 25.29 | 25.34 | 25.05 | 25.02 | 25.04 | 25.09 | 25.15 | 0.27 |

Table 2 : Reporting of Characterization Result

| UUC* Setting (°C) | UUC* Reading (°C) | | | Stability ± (°C) | Uniformity (°C) | Overall Variation (°C) |
|-------------------|-------------------|------|---------|------------------|-----------------|------------------------|
| | MIN | MAX | Average | | | |
| 22.0 | 22.0 | 22.0 | 22.0 | 0.026 | 0.14 | 0.29 |
| 25.0 | 25.0 | 25.0 | 25.0 | 0.035 | 0.36 | 0.55 |

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 %.

----- End -----

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

2008 อาคารศูนย์บริการการสอบเทียบ 10700, Thailand
2008 Soi 35, Arun Amarin Road, Bang Yi Khan Subdistrict, Bang Phlat District, Bangkok 10700, Thailand
Tel +66(0) 2422 8888 Fax +66(0) 2422 8545



Calibration Certificate

Certificate No.: 2502229-006-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road, Bangchack, Prakhonong, Bangkok 10260

Page 1 of 3

Equipment: CHAMBER (Incubator)

Manufacturer: BINDER

Model: KB 400

Serial No.: 20200000015535

ID No.: UAE.MIC.018/2564

Order No.: 2502229

Operation No.: 2502229-006

Date of Receipt: 19 March 2025

Date of Calibration: 19 March 2025

Calibrated by Scientist Approved by Manager, Division of Calibration Laboratory

Date of Issue: 25 March 2025

Responsible for the Technical Management Team

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.

F-CS-009 Revision: 01 Date: 20-04-65

2008 อาคารศูนย์บริการการสอบเทียบ 10700, Thailand
2008 Soi 35, Arun Amarin Road, Bang Yi Khan Subdistrict, Bang Phlat District, Bangkok 10700, Thailand
Tel +66(0) 2422 8888 Fax +66(0) 2422 8545



Calibration Report

Certificate No.: 2502229-006-01
Equipment: CHAMBER (Incubator)
Model: KB 400 Serial No.: 20200000015535
Resolution: 0.1 °C ID No.: UAE.MIC.018/2564
Manufacturer: BINDER

Date of Calibration: 19 March 2025

Page 2 of 3

Location: LABORATORY, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Environment Condition:
Ambient Temperature (18 ± 1) °C
Relative Humidity (50 ± 5) %
Line Voltage (223 ± 3) Volt

Condition of this results of Calibration:

- This instrument was calibrated by insert 13 standard thermometer into its chamber and calibration according to 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 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 | 34972A | MY49016851 | TE 670477-01 | 4 May 2025 | NATIONAL FOOD INSTITUTE |
| | RTD | CH#201-303 / RTD#201-303 | | | |

- 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.

- Reference of Calibrated item : Good

UUC Description :

Time of Record 1 Hour 9 Minute At 35.0 °C

Fresh air Damper
Open Position
Close Fan
Not Available

- Result of Calibration : X Without adjustment After adjustment

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

2008 อาคารศูนย์บริการการสอบเทียบ 10700, Thailand
2008 Soi 35, Arun Amarin Road, Bang Yi Khan Subdistrict, Bang Phlat District, Bangkok 10700, Thailand
Tel +66(0) 2422 8888 Fax +66(0) 2422 8545



Calibration Report

Certificate No.: 2502229-006-01
Equipment: CHAMBER (Incubator)
Model: KB 400 Serial No.: 20200000015535
Resolution: 0.1 °C ID No.: UAE.MIC.018/2564
Manufacturer: BINDER

Date of Calibration: 19 March 2025

Page 3 of 3

Calibration point: 35.0 °C

Calibration result:

| Calibration Condition | Temperature (°C) | Relative Humidity (%) | Line Voltage (Volt) |
|-----------------------|------------------|-----------------------|---------------------|
| MIN | 17.1 | 45 | 220.0 |
| MAX | 18.1 | 55 | 225.0 |

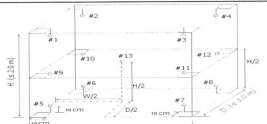


Table1 : Reporting of Temperature

| 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 | 34.98 | 35.17 | 34.99 | 34.92 | 35.18 | 35.01 | 35.00 | 35.13 | 35.00 | 34.96 | 35.02 | 35.17 | 35.04 | 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 | 35.0 | 35.0 | 0.029 | 0.15 | 0.30 |

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 %.

----- End -----

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

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2008 Soi 35, Arun Amarin Road, Bang Yi Khan Subdistrict, Bang Phlat District, Bangkok 10700, Thailand
Tel +66(0) 2422 8888 Fax +66(0) 2422 8545





Certificate of Calibration

Cert. No.: 25TM502
Page : 1 of 3

Equipment : Water Bath
Manufacturer : Memmert
Model : WNE 14
Serial No. : L421.0121
ID No. : UAE.MIC.007/2558
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260
Location : Microbiology Laboratory (302)
Received Order : 19 March 2025
Calibration Date : 19 March 2025
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V
Calibrated by : Krisda Malee
Approved by :
() Chakrit Waewwanjua
() Suwit Imjai
(✓) Kunchit Promprat
Issue Date : 27 March 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.

เอกสารไม่ควบคุม



Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2503-0436OC-2
Procedure Used :-

Cert. No.: 25TM502
Page : 2 of 3

Calibration were conducted using in-house calibration procedure CP-OT04 Based on ASTM E715 according to direct measurement method with Data Acquisition which connected with Industrial Platinum Resistance Thermometer (IPRT).

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 | MY57013823 | 23LM71 | TPA | 12 May 2025 |

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

3. This certification is traceable to the International System of Unit.

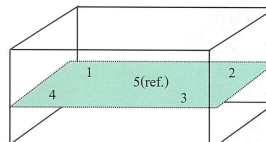
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Heat transfer medium used : Water

| | Environmental | | AC Voltage Supply |
|--------------------------|---------------|-----------|-------------------|
| | (°C) | (%R.H.) | (Volt) |
| Beginning of Calibration | 25 | 54 | 219 |
| Finished of Calibration | 23 | 52 | 220 |



Front

| Position : | Ref. Std. S/N.: |
|------------|-----------------|
| 1 | 4804539-006 |
| 2 | 4804539-007 |
| 3 | 4804539-008 |
| 4 | 4804539-009 |
| 5(ref.) | 4804539-010 |

เอกสารไม่ควบคุม



Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2503-0436OC-2
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source

Cert. No.: 25TM502
Page : 3 of 3

| Calibration point (°C) | UUC* Setting (°C) | UUC* Reading (°C) | Average* Standard Reading (°C) | | | | | Uncertainty (± °C) |
|--------------------------|---------------------|---------------------|----------------------------------|--------|--------|--------|----------|----------------------|
| | | | 1 | 2 | 3 | 4 | 5 (ref.) | |
| 44.5 | 44.5 | 44.5 | 44.462 | 44.474 | 44.483 | 44.499 | 44.479 | 0.15 |

| Calibration point (°C) | Uniformity (°C) | Stability (± °C) | Coverage Factor k |
|--------------------------|-------------------|--------------------|-------------------|
| 44.5 | 0.092 | 0.047 | 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 %.

-000-

เอกสารไม่ควบคุม



มูลนิธิสถาบันพัฒนาผู้ประกอบการ
ศูนย์บริการความรู้ทางวิทยาศาสตร์และเทคโนโลยี
Foundation for Industrial Development National Food Institute
Food Industrial Laboratory Service Center



Calibration Certificate

Certificate No.: 2502227-001-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong, Bangkok 10260

Page 1 of 3

Equipment: Electronic Balance
Manufacturer: OHAUS
Model: PX623
Serial No.: C236754745
ID No.: UAE.MIC.055/2565
Order No.: 2502227
Operation No.: 2502227-001
Date of Receipt: 19 March 2025
Date of Calibration: 19 March 2025

Calibrated by :
Scientist
Approved by :
(Mr.Pheraphat Tuanjit)
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.

E-CS-009 Revision: 01 Date: 20-04-65

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2008 ปีแรกเปิดบริการ 36 คนจบงานบริการ 10700 คน
2008 ปีแรกเปิดบริการ 36 คนจบงานบริการ 10700 คน
Tel : +66(0) 2422 8688 Fax : +66(0) 2422 8545



เอกสารไม่ควบคุม

Calibration Report

Certificate No.: 2502227-001-01
Equipment: Electronic Balance
Model: PX623
Serial No.: C236754745
Capacity: 620
Manufacturer: OHAUS
Resolution: 0.001
ID No.: UAE.MIC.055/2565

Date of Calibration: 19 March 2025

Page 3 of 3

Calibration Results: (Continued)

Calibration Range: 0-600 g

Calibration Adjustment: Internal Calibration

3. Departure from Nominal Value:

| Nominal Value (g) | Standard Value (g) | Average Reading (g) | Correction (g) | Uncertainty (± g) | Coverage Factor k |
|------------------------|-------------------------|--------------------------|---------------------|------------------------|----------------------|
| Unload | 0.0000 | 0.000 | 0.000 | 0.00086 | 2.00 |
| 1 | 1.0000 | 1.000 | 0.000 | 0.00086 | 2.00 |
| 5 | 5.0000 | 4.999 | 0.001 | 0.00086 | 2.00 |
| 10 | 10.0000 | 10.000 | 0.000 | 0.00086 | 2.00 |
| 20 | 20.0000 | 20.000 | 0.000 | 0.00086 | 2.00 |
| 50 | 50.0000 | 50.000 | 0.000 | 0.00087 | 2.00 |
| 100 | 100.0001 | 100.000 | 0.000 | 0.00087 | 2.00 |
| 200 | 200.0001 | 200.001 | -0.001 | 0.00090 | 2.00 |
| 300 | 300.0002 | 300.001 | -0.001 | 0.00094 | 2.00 |
| 400 | 400.0003 | 399.999 | 0.001 | 0.0011 | 2.00 |
| 500 | 500.0003 | 499.999 | 0.001 | 0.0011 | 2.00 |
| 600 | 600.0004 | 600.000 | 0.000 | 0.0012 | 2.00 |

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 %.

----- End -----

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

2008 บางเขน กรุงเทพฯ 36 บางเขน กรุงเทพฯ แขวงบางเขน เขตบางเขน กรุงเทพมหานคร 10700
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



Calibration Report

Certificate No.: 2502227-001-01
Equipment: Electronic Balance
Model: PX623
Serial No.: C236754745
Capacity: 620
Manufacturer: OHAUS
Resolution: 0.001
ID No.: UAE.MIC.055/2565

Date of Calibration: 19 March 2025

Page 2 of 3

Environment Condition: Ambient Temperature: 22.8 ± 0.3 °C Relative Humidity: 51 ± 0.95 %

Place of Calibration: 301, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Condition of Equipment: Good Condition

Condition of This Results of Calibration:

1. Calibration Method: NFI Method W-MA-001 In-House Method based on UKAS Lab 14 : 2019

2. Reference Standards:

| Reference Standard | Model | Serial No. | Calibrated By | Certificate No. | Due Date |
|--------------------------|-------------|------------|---------------|-----------------|---------------|
| Standard Weight Class E2 | 1mg to 200g | B505567572 | TCS | M24041005 | 19 April 2025 |
| Standard Weight Class E2 | 500g | B505567696 | TCS | M24041015 | 19 April 2025 |

| Instrument | Model | Serial No. | Calibrated By | Certificate No. | Due Date |
|--------------------|--------|----------------|----------------|-----------------|------------------|
| Thermo-Hygro Meter | 608-H1 | NFI.BTH 017/23 | Quality Reborn | QR25-0542 | 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:

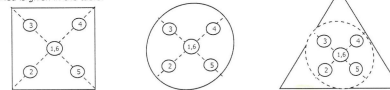
1. Repeatability of Reading:

| Nominal Value (g) | Standard Deviation of Reading (g) |
|---------------------|-------------------------------------|
| 300 | 0.00042 |
| 600 | 0.00048 |

2. Off-Center Error:

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) | 6 (g) | (Maximum Difference) (g) |
|------------|------------|------------|------------|------------|------------|-------------------------------|
| 200.002 | 200.003 | 200.001 | 200.001 | 200.002 | 200.002 | 0.001 |

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

2008 บางเขน กรุงเทพฯ 36 บางเขน กรุงเทพฯ แขวงบางเขน เขตบางเขน กรุงเทพมหานคร 10700
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



Calibration Certificate

Certificate No.: 2502229-007-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road,
Bangchack, Prakhonong, Bangkok 10260

Page 1 of 3

Equipment: Autoclave
Manufacturer: ALP
Model: CL-40L
Serial No.: 808763
ID No.: UAE.MIC.026/2563
Order No.: 2502229
Operation No.: 2502229-007
Date of Receipt: 19 March 2025
Date of Calibration: 19 March 2025

Calibrated by

Scientist

Approved by

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.

F-CS-009 Revision: 01 Date: 20-04-65

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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



Calibration Report

Certificate No.: 2502229-007-01
Equipment: Autoclave
Model: CL-40L
Serial No.: 808763
Resolution: 0.1 °C
ID No.: UAE.MIC.026/2563
Manufacturer: ALP

Date of Calibration: 19 March 2025

Page 2 of 3

Location: LABORATORY, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Environment Condition: Ambient Temperature (23 ± 1) °C

Relative Humidity (60 ± 5) %

Line Voltage (225 ± 1) Volt

Condition of this results of Calibration:

1. This instrument was calibrated by insert 3 standard Data loggers with RTD into its autoclave and calibration

according to 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 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. | Certificate No. | Due Date | Through |
|---|--------------|------------|-----------------|-----------|----------------------------|
| Digital Thermometer with RTD (Data Logger) | HiTemp140-PT | S35646 | TE 670370-01 | 23-Mar-25 | NATIONAL FOOD INSTITUTE |
| | HiTemp140-PT | S33753 | TE 670371-01 | 23-Mar-25 | NATIONAL FOOD INSTITUTE |
| | HiTemp140-PT | S29973 | TE 670372-01 | 23-Mar-25 | 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. This standard does not apply to sterilizers or disinfectors used for medical, dental, pharmaceutical.

7. Condition of Calibrated item : Good

UUC Description : Setting program function sterilization : STERILIZE/NORMAL

Time of sterilization 15 Minute At 115.0 ± 121.0 °C

8. Result of Calibration :

☒ Without adjustment
☐ After adjustment

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

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