

เอกสารแนบ 6

เอกสารสอบเทียบเครื่องมือ
ที่ใช้ในการวิเคราะห์



Equipment : Cooled Incubator
Condition As-Received : Used Item
Reference : 2205-0764OC-1

Cert. No.: 22TM347
Page.: 2 of 3

Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 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 | Model | Serial No. | Cert. No. | Due Date |
|----------------------|--------|------------|-----------|-------------|
| 1) Data Acquisition | 34970A | MY44067817 | 21LM10 | 20 Jul 2022 |

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

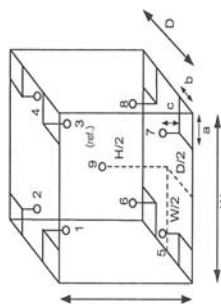
3. This certification is traceable to the International System of Unit.

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Not Available

Fan Setting : 100.0%



Probe Installation Details :

| Dimension of Chamber : | Value |
|------------------------|---------------------|
| a = | 10 cm |
| b = | 10 cm |
| c = | 14 cm |
| D = | 0.48 m |
| W = | 0.65 m |
| H = | 1.3 m |
| Capacity = | 0.40 m ³ |

| Position : | Ref. Std. ID No.: |
|------------|-------------------|
| 1 | 15RTD2/11 |
| 2 | 15RTD2/12 |
| 3 | 15RTD2/13 |
| 4 | 15RTD2/14 |
| 5 | 15RTD2/15 |
| 6 | 15RTD2/16 |
| 7 | 15RTD2/17 |
| 8 | 15RTD2/18 |
| 9 (ref.) | 15RTD2/19 |

| Environment during calibration | | |
|--------------------------------|-----------|----------|
| | Beginning | Finished |
| Temp. (°C) | 21 | 21 |
| REL.Humid. (%) | 67 | 65 |
| AC Supply (Volt) | 233 | 234 |



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MSZ-TB-1817024
CALIBRATION 0008

Cert. No.: 22TM347
Page.: 1 of 3

Certificate of Calibration

Equipment : Cooled Incubator

Manufacturer : Binder

Model : KB 400 E6

Serial No. : 20200000015535

ID No. : UAE.MIC.018/2564

Submitted by :

United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260

Location :

Microbiology Laboratory

Received Order :

27 May 2022

Calibration Date :

27 May 2022

Ambient Temperature :

(26 ± 10) °C

Relative Humidity :

(50 ± 30) %

Calibrated by :

Suwit Imjai

Approved by :

() Pornthippa Tameyakul
() Malee Butkruea

Issue Date :

2 June 2022

The Uncertainties are for a confidence probability of approximately 95 %

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เอกสารควบคุม



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JAE-MRA
JANET ASSOCIATION
CALIBRATION 0008

Certificate of Calibration

Cert. No.: 22TM503
Page.: 1 of 3

Equipment : Incubator
Manufacturer : Memmert
Model : IPP 260
Serial No. : V618.0033
ID No. : UAE.MIC.021/2561

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 : 3 May 2022
Calibration Date : 3 May 2022
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %

Calibrated by : Krisda Malee

Approved by :

(/) Ponthippa Tameyakul
(/) Malee Butkruea
() Suwit Imjai

Issue Date : 10 May 2022

The Uncertainties are for a confidence probability of approximately 95%

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เอกสารไม่ควบคุม



Equipment : Cooled Incubator
Condition As-Received : Used Item
Reference : 2205-0764OC-1
Result of Calibration : (*) Without Adjustment

Function of UUC* : Temperature Source
Fresh air setting : Not Available

| Calibration Point (°C) | UUC* Setting (°C) | UUC* Reading (°C) | Temperature stability (± °C) | Temperature uniformity (°C) | Overall Variation (°C) | Uncertainty (± °C) | Coverage Factor k |
|-----------------------------|---------------------|---------------------|--------------------------------|-------------------------------|--------------------------|----------------------|-------------------|
| 35.0 | 34.9 | 34.9 | 0.017 | 0.31 | 0.38 | 0.30 | 2 |
| Measured Temperature (°C) | | | | | | | |
| Position | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 35.0 | 34.808 | 35.139 | 34.922 | 35.062 | 35.109 | 35.132 | 35.129 |
| | | | | | | | 9 (ref.) |
| | | | | | | | 35.092 |

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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เอกสารควบคุม



Equipment : Incubator
Condition As-Received : Used Item
Reference : 2205-0003OC-4
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Not Available

Cert. No.: 22TM503
Page.: 3 of 3

| Calibration Point (°C) | UUC* Setting (°C) | UUC* Reading (°C) | Temperature stability (± °C) | Temperature uniformity (°C) | Overall Variation (°C) | Uncertainty (± °C) | Coverage Factor k |
|-----------------------------|---------------------|---------------------|--------------------------------|-------------------------------|--------------------------|----------------------|-------------------|
| 22.0 | 22.0 | 22.0 | 0.051 | 0.095 | 0.19 | 0.30 | 2 |
| 44.0 | 44.0 | 44.0 | 0.10 | 0.83 | 1.2 | 0.32 | 2 |
| Measured Temperature (°C) | | | | | | | |
| Calibration Point (°C) | Position | | | | | | |
| 22.0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 44.0 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |

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



Equipment : Incubator
Condition As-Received : Used Item
Reference : 2205-0003OC-4
Procedure Used :-

Cert. No.: 22TM503
Page.: 2 of 3

Calibration were conducted using calibration procedure CP-OT02 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 Model Serial No. Cert. No. Due Date

1) Data Acquisition 34970A MY49023932 21LM8 06 Jul 2022

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

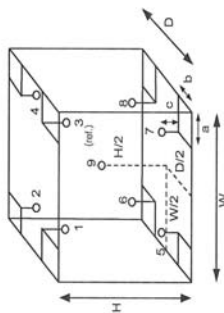
3. This certification is traceable to the International System of Unit.

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Not Available

| Environment during calibration | |
|--------------------------------|-----|
| Temp. (°C) | 23 |
| REL.Humid. (%) | 53 |
| AC Supply (Volt) | 221 |



Probe Installation Details :
a = 5.0 cm
b = 5.0 cm
c = 5.0 cm
Dimension of Chamber :
D = 0.50 m
W = 0.64 m
H = 0.80 m
Capacity = 0.26 m³

| Position : | Ref. Std. ID No.: |
|------------|-------------------|
| 1 | 20-16RTD-01 |
| 2 | 20-16RTD-02 |
| 3 | 20-16RTD-03 |
| 4 | 20-16RTD-04 |
| 5 | 20-16RTD-05 |
| 6 | 20-16RTD-06 |
| 7 | 20-16RTD-07 |
| 8 | 20-16RTD-08 |
| 9 (ref.) | 20-16RTD-09 |

เอกสารไม่ควบคุม



Equipment : Incubator
Condition As-Received : Used Item
Reference : 2205-0003OC-1

Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 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

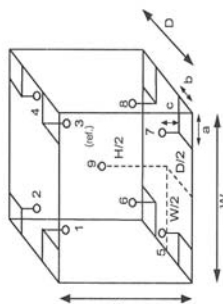
1. Reference standard instrument:-

| Instrument | Model | Serial No. | Cert. No. | Due Date |
|----------------------|--------|------------|-----------|-------------|
| 1) Data Acquisition | 34970A | MY44067817 | 21LM10 | 20 Jul 2022 |
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.

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close



Probe Installation Details :

Dimension of Chamber :
a = 5.0 cm
b = 5.0 cm
c = 5.0 cm
D = 0.32 m
W = 0.42 m
H = 0.56 m
Capacity = 0.075 m³

| Position : | Ref. Std. ID No.: |
|------------|-------------------|
| 1 | 19-15RTD-01 |
| 2 | 19-15RTD-02 |
| 3 | 19-15RTD-03 |
| 4 | 19-15RTD-04 |
| 5 | 19-15RTD-05 |
| 6 | 21-15RTD-06 |
| 7 | 19-15RTD-07 |
| 8 | 19-15RTD-08 |
| 9 (ref.) | 19-15RTD-09 |

| Environment during calibration | | |
|--------------------------------|-----------|----------|
| Temp. (°C) | Beginning | Finished |
| REL.Humid. (%) | 23 | 23 |
| AC Supply (Volt) | 59 | 59 |
| | 221 | 221 |




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MSC TEST LABS
CALIBRATION 0008

Cert. No.: 22TM670
Page.: 1 of 3

Certificate of Calibration

Equipment : Incubator
Manufacturer : Memmert
Model : IF 75
Serial No. : D317.0305
ID No. : UAE.MIC.022/2561
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 : 3 May 2022
Calibration Date : 3 May 2022
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
Calibrated by : Preecha Hiahb
Approved by : 
() Pornthippa Tameyakul
() Malee Buikrua
() Suwit Imjai

Issue Date : 10 May 2022

The Uncertainties are for a confidence probability of approximately 95 %

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TAA-CALIBRATION
CALIBRATION 0008

Cert. No.: 22TM671
Page.: 1 of 3

Certificate of Calibration

Equipment : Incubator
Manufacturer : Memmert
Model : IN 75
Serial No. : D317.0307
ID No. : UAE.MIC.023/2561
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 : 3 May 2022
Calibration Date : 3 May 2022
Ambient Temperature : $(26 \pm 10) ^\circ\text{C}$
Relative Humidity : $(50 \pm 30) \%$

Calibrated by : Preecha Hlahib
Approved by : 

() Pornthippa Tameyakul
() Malee Butkruea
() Suwit Imjai

Issue Date : 10 May 2022

The Uncertainties are for a confidence probability of approximately 95 %

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Equipment : Incubator
Condition As-Received : Used Item
Reference : 2205-0003OC-1
Result of Calibration : (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

| Calibration Point (°C) | UUC* Setting (°C) | UUC* Reading (°C) | Temperature stability (± °C) | Temperature uniformity (°C) | Overall Variation (°C) | Uncertainty (± °C) | Coverage Factor k |
|-----------------------------|---------------------|---------------------|--------------------------------|-------------------------------|--------------------------|----------------------|-------------------|
| 44.0 | 44.0 | 44.0 | 0.044 | 0.25 | 0.33 | 0.30 | 2 |
| Measured Temperature (°C) | | | | | | | |
| Position | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 43.974 | 44.147 | 44.182 | 44.140 | 44.105 | 44.009 | 43.931 | 44.021 |
| 44.0 | | | | | | | 44.152 |

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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เอกสารไม่



Equipment : Incubator
Condition As-Received : Used Item
Reference : 2205-0003OC-2
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Cert. No.: 22TM671
Page.: 3 of 3

| Calibration Point (°C) | UUC* Setting (°C) | UUC* Reading (°C) | Temperature stability (± °C) | Temperature uniformity (°C) | Overall Variation (°C) | Uncertainty (± °C) | Coverage Factor k |
|-----------------------------|---------------------|---------------------|--------------------------------|-------------------------------|--------------------------|----------------------|-------------------|
| 36.0 | 36.0 | 36.0 | 0.058 | 0.29 | 0.49 | 0.30 | 2 |
| Measured Temperature (°C) | | | | | | | |
| Position | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 36.031 | 36.035 | 36.008 | 36.063 | 35.621 | 35.716 | 35.618 | 35.778 |
| | | | | | | | 9 (ref.) |
| | | | | | | | 35.798 |

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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Equipment : Incubator
Condition As-Received : Used Item
Reference : 2205-0003OC-2
Procedure Used :-

Cert. No.: 22TM671
Page.: 2 of 3

Calibration were conducted using calibration procedure CP-OT02 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 Model Serial No. Cert. No. Due Date
1) Data Acquisition 34970A MY44067817 21LM10 20 Jul 2022

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

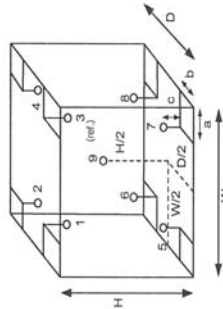
3. This certification is traceable to the International System of Unit.

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close

| Environment during calibration | | |
|--------------------------------|-----------|----------|
| | Beginning | Finished |
| Temp. (°C) | 24 | 23 |
| REL.Humid. (%) | 55 | 59 |
| AC Supply (Volt) | 220 | 221 |



Probe Installation Details :

a = 5.0 cm
b = 5.0 cm
c = 5.0 cm
Dimension of Chamber :
D = 0.32 m
W = 0.42 m
H = 0.56 m
Capacity = 0.075 m³

| Position : | Ref. Std. ID No.: |
|------------|-------------------|
| 1 | 19-15RTD-01 |
| 2 | 19-15RTD-02 |
| 3 | 19-15RTD-03 |
| 4 | 19-15RTD-04 |
| 5 | 19-15RTD-05 |
| 6 | 21-15RTD-06 |
| 7 | 19-15RTD-07 |
| 8 | 19-15RTD-08 |
| 9 (ref.) | 19-15RTD-09 |

เอกสารไม่

เอกสารไม่



Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2202-0444OC-3
Procedure Used :-

Calibration were conducted using in-house calibration procedure CP-OT04 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 | Model | Serial No. | Cert. No. | Due Date |
|----------------------|--------|------------|-----------|-------------|
| 1) Data Acquisition | 34970A | MY44067817 | 21LM10 | 20 Jul 2022 |

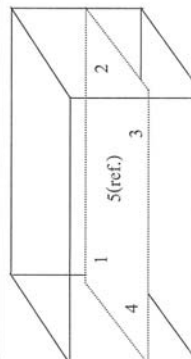
2. This certificate is valid only to the item calibrated on date and place of calibration.

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

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

| | Environmental | | AC Voltage Supply (Volt) |
|--------------------------|---------------|-----------|-------------------------------|
| | (°C) | (%R.H.) | |
| Beginning of Calibration | 21 | 65 | 229 |
| Finished of Calibration | 22 | 58 | 230 |



Front

| Position : | Ref. Std. ID No.: |
|------------|----------------------|
| 1 | 70RC143 |
| 2 | 70RC144 |
| 3 | 70RC145 |
| 4 | 70RC146 |
| 5(ref.) | 70RC147 |




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Cert. No.: 22TM333
Page.: 1 of 3

Certificate of Calibration

| | |
|-----------------------|---|
| Equipment : | Water Bath |
| Manufacturer : | Memmert |
| Model : | WNE 14 |
| Serial No. : | L416.0606 |
| ID No. : | UAE.MIC.002/2560 |
| Submitted by : | United Analyst and Engineering Consultant Co.,Ltd. 3 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260 Microbiology Laboratory |
| Location : | |
| Received Order : | 17 February 2022 |
| Calibration Date : | 17 February 2022 |
| Ambient Temperature : | (26 ± 10) °C |
| Relative Humidity : | (50 ± 30) % |
| Calibrated by : | Suwit Imjai |
| Approved by : |  Ponthippa Tameyakul Malee Bulkruea |

Approved Signatory

Issue Date : 22 February 2022

The Uncertainties are for a confidence probability of approximately 95%

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NSC-TS1-TS17025
CALIBRATION 0008

Cert. No.: 22TM334
Page.: 1 of 3

Certificate of Calibration

Equipment : Water Bath

Manufacturer : Memmert

Model : WNE 14

Serial No. : L416.0612

ID No. : UAE.MIC.003/2560

Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260
Microbiology Laboratory

Location :

Received Order : 17 February 2022

Calibration Date : 17 February 2022

Ambient Temperature : (26 ± 10) °C

Relative Humidity : (50 ± 30) %

Calibrated by : Suwit Imjai

Approved by :

() Pornthippa Tameyakul
() Malee Butkruea

Issue Date : 22 February 2022

The Uncertainties are for a confidence probability of approximately 95 %

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เอกสารฉบับนี้

A 0038095



Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2202-0444OC-3
Result of Calibration : (*) Without Adjustment
Function of UUC* : Temperature Source

| Calibration point (°C) | UUC* Setting (°C) | UUC* Reading (°C) | Average* Standard Reading (°C) | | | | |
|--------------------------|---------------------|---------------------|----------------------------------|--------|--------|--------|----------|
| | | | 1 | 2 | 3 | 4 | 5 (ref.) |
| 44.5 | 44.5 | 44.5 | 44.498 | 44.481 | 44.482 | 44.518 | 44.534 |

| Calibration point (°C) | Uniformity (°C) | Stability (± °C) | Uncertainty (± °C) | Coverage Factor k |
|--------------------------|-------------------|--------------------|----------------------|-------------------|
| 44.5 | 0.13 | 0.057 | 0.15 | 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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Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2202-0444OC-4
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source

Cert. No.: 22TM334
Page.: 3 of 3

| Calibration point (°C) | UUC* Setting (°C) | UUC* Reading (°C) | Average* Standard Reading (°C) | | | | |
|--------------------------|---------------------|---------------------|----------------------------------|--------|--------|--------|----------|
| | | | Position | | | | |
| 44.5 | 44.5 | 44.5 | 1 | 2 | 3 | 4 | 5 (ref.) |
| | | | 44.572 | 44.514 | 44.507 | 44.530 | 44.565 |

| Calibration point (°C) | Uniformity (°C) | Stability (± °C) | Uncertainty (± °C) | Coverage Factor <i>k</i> |
|--------------------------|-------------------|--------------------|----------------------|--------------------------|
| 44.5 | 0.10 | 0.042 | 0.15 | 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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Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2202-0444OC-4
Procedure Used :-

Cert. No.: 22TM334
Page.: 2 of 3

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

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument **Model** **Serial No.** **Cert. No.** **Due Date**
1) Data Acquisition 34970A MY44067817 21LM10 20 Jul 2022

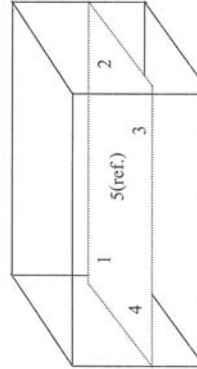
2. This certificate is valid only to the item calibrated on date and place of calibration.

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

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

| | Environmental | | AC Voltage Supply (Volt) |
|--------------------------|---------------|-----------|----------------------------|
| | (°C) | (%R.H.) | |
| Beginning of Calibration | 21 | 65 | 229 |
| Finished of Calibration | 22 | 57 | 230 |



Front

| Position : | Ref. Std. ID No.: |
|------------|-------------------|
| 1 | 70RC143 |
| 2 | 70RC144 |
| 3 | 70RC145 |
| 4 | 70RC146 |
| 5(ref.) | 70RC147 |

Measurement Results

Repeatability



The "d" in the graph represents the readability of the range/interval in which the test was performed.
The results of this graph are based upon the absolute values of the differences from the mean value.

Eccentricity



The "d" in the graph represents the readability of the range/interval in which the test was performed.

Mettler-Toledo (Thailand) Ltd.
846/4 - 846/5 Lasalle Rd., Bangna Tai Sub-District
Bangna District, Bangkok 10260
+66 2723 0382
MT-TH.ServiceSupport@mt.com

Accuracy Calibration Certificate

Customer

Company: United Analyst and Engineering Consultant Co., Ltd.
Address: 3 Soi Udom Suk 41, Sukhumvit Rd., Bang Chak
City: Phra Khanong
Zip / Postal: 10260
State / Province: Bangkok
Order Number:

Contact: Suwit Chotnok

Weighing Device

Manufacturer: Mettler Toledo
Model: MS603S/01
Serial No.: B007010311
Building: N/A
Floor: 2
Room: Balance Room (206)

Instrument Type: Weighing Instrument
Asset Number: UAE MIC.008/2553
Terminal Model: N/A
Terminal Serial No.: N/A
Terminal Asset No.: N/A

| Range | Max. Capacity | Readability (d) |
|-------|---------------|-----------------|
| 1 | 620 g | 0.001 g |

Procedure

Calibration Guideline: EURAMET cg-18 v. 4.0 (11/2015)
CPM002/20

METTLER TOLEDO Work Instruction:
This calibration certificate contains measurements for As Found calibration. No As Left calibration was performed because the device was not modified after As Found calibration. Therefore, results for As Left correspond to As Found.
The sensitivity/span of the weighing instrument was adjusted before calibration with a built-in weight.
In accordance with EURAMET cg-18 (11/2015), the test loads were selected to reflect the specific use of the weighing device or to accommodate specific calibration conditions.

| | Temperature | Humidity |
|----------|-----------------------------|---------------------------|
| As Found | Start: 22.8 °C End: 23.0 °C | Start: 49.9 % End: 58.3 % |

As Found Calibration Date: 07-Apr-2022
As Left Calibration Date: N/A
Issue Date: 08-Apr-2022

Calibrator:
Approved Signatory:

☒ Kasakorn Tassanachaisakul
☐ Santi Jitinyom
☐ Surachet Sukkate

Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

| | | | |
|------------------------------|---------------|-----------------------|-------------|
| Weight Set 1: OIML F1 | | | |
| Weight Set No.: | WS55 | Date of Issue: | 09-Jul-2021 |
| Certificate Number: | CCM-0137-21-C | Calibration Due Date: | 07-Jul-2022 |
| Weight Set 2: OIML E2 | | | |
| Weight Set No.: | WS80 | Date of Issue: | 23-Feb-2022 |
| Certificate Number: | C208581631 | Calibration Due Date: | 14-Aug-2023 |
| Thermo Hygrometer | | | |
| Equipment No.: | IN161 | Date of Issue: | 14-Jun-2021 |
| Certificate Number: | 21H1220 | Calibration Due Date: | 01-Jun-2022 |

Remarks

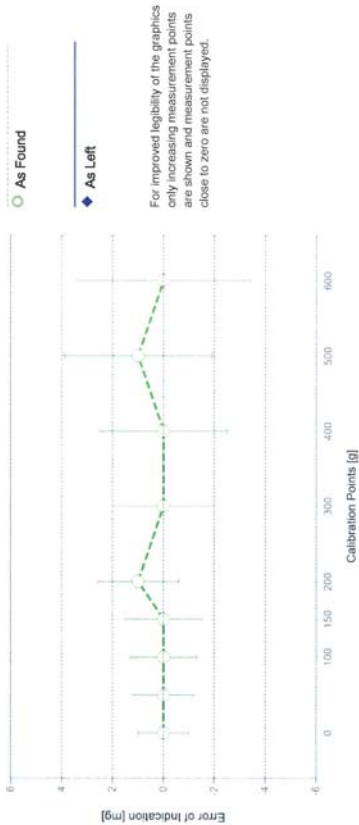
FACT adjustment functionality activated
Equipment condition: Good
Next calibration according to customer's procedure
Calibration data not decide by calibration laboratory

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Error of Indication

| As Found | Reference Value | Indication | Error of Indication | Expanded Uncertainty | k |
|----------|-----------------|------------|---------------------|----------------------|---|
| 1 | 0.000 g | 0.000 g | 0.000 g | 1.0 mg | 2 |
| 2 | 0.500 g | 0.500 g | 0.000 g | 1.2 mg | 2 |
| 3 | 1.000 g | 1.000 g | 0.000 g | 1.2 mg | 2 |
| 4 | 50.000 g | 50.000 g | 0.000 g | 1.2 mg | 2 |
| 5 | 100.000 g | 100.000 g | 0.000 g | 1.3 mg | 2 |
| 6 | 150.000 g | 150.000 g | 0.000 g | 1.5 mg | 2 |
| 7 | 200.000 g | 200.001 g | 0.001 g | 1.6 mg | 2 |
| 8 | 300.001 g | 300.001 g | 0.000 g | 2.0 mg | 2 |
| 9 | 400.001 g | 400.001 g | 0.000 g | 2.5 mg | 2 |
| 10 | 500.001 g | 500.002 g | 0.001 g | 2.9 mg | 2 |
| 11 | 600.001 g | 600.001 g | 0.000 g | 3.4 mg | 2 |



The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k – which can be larger than 2 according to EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

| | | | |
|------------------------------|---------------|-----------------------|-------------|
| Weight Set 1: OIML F1 | | | |
| Weight Set No.: | WS55 | Date of Issue: | 09-Jul-2021 |
| Certificate Number: | CCM-0137-21-C | Calibration Due Date: | 07-Jul-2022 |
| Weight Set 2: OIML E2 | | | |
| Weight Set No.: | WS80 | Date of Issue: | 23-Feb-2022 |
| Certificate Number: | C208581631 | Calibration Due Date: | 14-Aug-2023 |
| Thermo Hygrometer | | | |
| Equipment No.: | IN161 | Date of Issue: | 14-Jun-2021 |
| Certificate Number: | 21H1220 | Calibration Due Date: | 01-Jun-2022 |

Remarks

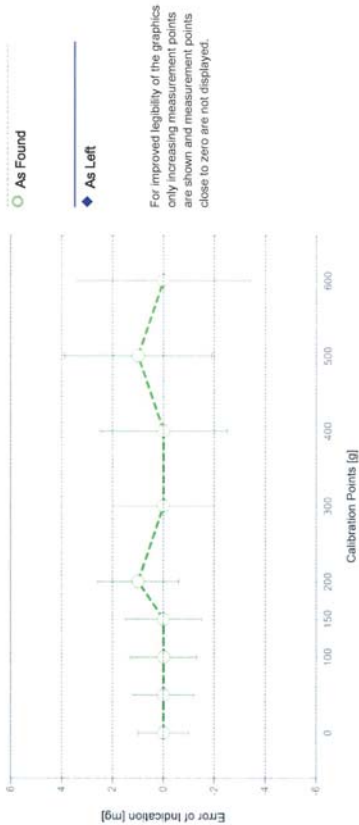
FACT adjustment functionality activated
Equipment condition: Good
Next calibration according to customer's procedure
Calibration data not decide by calibration laboratory

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Error of Indication

| As Found | Reference Value | Indication | Error of Indication | Expanded Uncertainty | k |
|----------|-----------------|------------|---------------------|----------------------|---|
| 1 | 0.000 g | 0.000 g | 0.000 g | 1.0 mg | 2 |
| 2 | 0.500 g | 0.500 g | 0.000 g | 1.2 mg | 2 |
| 3 | 1.000 g | 1.000 g | 0.000 g | 1.2 mg | 2 |
| 4 | 50.000 g | 50.000 g | 0.000 g | 1.2 mg | 2 |
| 5 | 100.000 g | 100.000 g | 0.000 g | 1.3 mg | 2 |
| 6 | 150.000 g | 150.000 g | 0.000 g | 1.5 mg | 2 |
| 7 | 200.000 g | 200.001 g | 0.001 g | 1.6 mg | 2 |
| 8 | 300.001 g | 300.001 g | 0.000 g | 2.0 mg | 2 |
| 9 | 400.001 g | 400.001 g | 0.000 g | 2.5 mg | 2 |
| 10 | 500.001 g | 500.002 g | 0.001 g | 2.9 mg | 2 |
| 11 | 600.001 g | 600.001 g | 0.000 g | 3.4 mg | 2 |



The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k – which can be larger than 2 according to EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.



TECHNOLOGY PROMOTION ASSOCIATION (THAIAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
53/44 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-27 FAX. 0-2719-9484



NSC-TIS-TIS179.25
CALIBRATION 0008

Cert. No.: 22TM89
Page: 1 of 3

Certificate of Calibration

Equipment : Autoclave
Manufacturer : ALP
Model : CL-40L
Serial No. : 802664
ID No. : UAE.MIC.014/2550
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260
Location : Air Analysis Unit
Received Order : 17 February 2022
Calibration Date : 17 February 2022
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
Calibrated by : Kunchit Promprat
Approved by : 
() Ponthippa Tameyakul
() Malee Bulkruea
() Suwit Injai
Issue Date : 22 February 2022

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.

เอกสารฉบับนี้
เป็นเอกสารลับ

ANZ0009

Calibration Certificate ID
TH2058-086-040722-ACC-TH

METTLER TOLEDO Service

Measurement Uncertainty of the Weighing Instrument in Use

Stated is the expanded uncertainty with $k=2$ in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Temperature coefficient for the evaluation of the measurement uncertainty in use: $3.0 \cdot 10^{-6} / K$

Temperature range on site for the evaluation of the measurement uncertainty in use: $3 K$

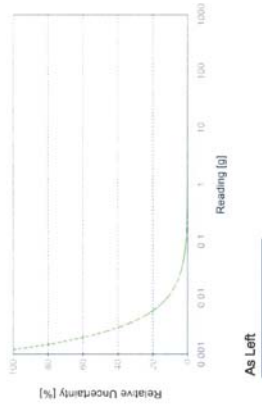
Linearization of Uncertainty Equation

| Range | As Found | | As Left |
|-------|----------|-------|---------|
| | d | Max | |
| 1 | 0.001 g | 620 g | N/A |

To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

| Net Indication | As Found | | As Left |
|----------------|----------------|-------------|---------|
| | Net Indication | Uncertainty | |
| 0.062 g | 1.2 mg | 1.9% | N/A |
| 0.620 g | 1.2 mg | 0.20% | N/A |
| 6.200 g | 1.3 mg | 0.021% | N/A |
| 62.000 g | 2.4 mg | 0.0038% | N/A |
| 620.000 g | 13 mg | 0.0021% | N/A |





Equipment : Autoclave
Condition As-Received : Used Item
Reference : 2202-0444OC-1
Result of Calibration :- (*) Without Adjustment

Cert. No.: 22TM89
Page.: 3 of 3

Operating parameter Set : Temperature = 122 °C
Sterilization period = 30 minute

| UUC* Setting (°C) | UUC* Reading (°C) | Position | Average* Standard Reading (°C) | Stability (± °C) | Pressure Reading (MPa) | Uncertainty (± °C) | Coverage Factor <i>k</i> |
|---------------------------|---------------------------|----------|--|-----------------------|--------------------------------|-------------------------|--------------------------------|
| 122 | 122 | 1 | 122.373 | 0.32 | 0.12 | 1.2 | 2 |
| | | 2 | 122.421 | | | | |
| | | 3 | 122.292 | | | | |

Average* : The average of 30 values in each position.
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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Equipment : Autoclave
Condition As-Received : Used Item
Reference : 2202-0444OC-1
Procedure Used :-

Cert. No.: 22TM89
Page.: 2 of 3

Calibration were conducted using in-house calibration procedure CP-OT03 according to direct measurement method with Data Acquisition which connected with Thermocouple Type T
The temperature scale used was based on ITS-90.

Condition of this result of calibration

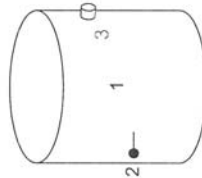
1. Reference standard instrument:-

| Instrument | Model | Serial No. | Cert. No. | Due Date |
|--|--------|------------|-----------|-------------|
| 1) Data Acquisition | 34970A | MY44035217 | 21LM30 | 23 Dec 2022 |
| 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. | | | | |

4. This result of calibration covers laboratory autoclaves for the sterilization of goods and material which could be infected with organisms categorized as Hazard Group 1, 2 and 3**
(** = Categorization of pathogens according to hazard and categories of containment, second edition, 1990)
It does not cover autoclaves for use with material infect with organisms in Hazard Group 4, for which complete containment and sterilization of infected condensate is considered to be essential.

This result of calibration does not apply to sterilizers or disinfectors used for medical, dental, pharmaceutical or veterinary purposes which are directly concerned with patient care, or those used for fabrics subjected to sterilization which are required to be dry at the end of cycle.

Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source



| | Environmental | |
|--------------------------|---------------|--------------------|
| | (°C) | (%R.H.) (Volt) |
| Beginning of Calibration | 27 | 68 |
| Finished of Calibration | 27 | 65 |

| Position | Description | Ref. Std. ID No.: |
|----------|--------------------|-------------------|
| 1 = | Center of chamber | 22-10TC-01 |
| 2 = | Temperature sensor | 22-10TC-02 |
| 3 = | Exhaust port | 22-10TC-03 |



Equipment : Autoclave
Condition As-Received : Used Item
Reference : 2205-0764OC-2
Procedure Used :

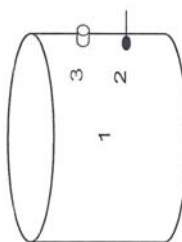
Calibration were conducted using in-house calibration procedure CP-OT03 according to direct measurement method with Data Acquisition which connected with Thermocouple Type T
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-
- | Instrument | Model | Serial No. | Cert. No. | Due Date |
|----------------------|--------|------------|-----------|-------------|
| 1) Data Acquisition | 34970A | MY44060450 | 22LM46 | 28 Mar 2023 |
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.
4. This result of calibration covers laboratory autoclaves for the sterilization of goods and material which could be infected with organisms categorized as Hazard Group 1, 2 and 3**
(* = Categorization of pathogens according to hazard and categories of containment, second edition, 1990)
It does not cover autoclaves for use with material infect with organisms in Hazard Group 4, for which complete containment and sterilization of infected condensate is considered to be essential.

This result of calibration does not apply to sterilizers or disinfectors used for medical, dental, pharmaceutical or veterinary purposes which are directly concerned with patient care, or those used for fabrics subjected to sterilization which are required to be dry at the end of cycle.

Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source



| | Environmental | | |
|--------------------------|---------------|-----------|----------|
| | (°C) | (%R.H.) | (Volt) |
| Beginning of Calibration | 27 | 56 | 220 |
| Finished of Calibration | 27 | 59 | 221 |

| Position | Description | Ref. Std. ID No.: |
|----------|--------------------|-------------------|
| 1 = | Center of chamber | 22-14TC-01 |
| 2 = | Temperature sensor | 22-14TC-02 |
| 3 = | Exhaust port | 22-14TC-03 |

เอกสารไม่



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-27 FAX. 0-2719-9484



Cert. No.: 22TM681
Page.: 1 of 3

Certificate of Calibration

Equipment : Autoclave

Manufacturer : ALP

Model : CL-40L

Serial No. : 808763

ID No. : UAE.MIC.026/2563

Submitted by :

United Analyst and Engineering Consultant Co.,Ltd.
3 Sol Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260
Microbiology Laboratory (301)

Location :

Received Order : 27 May 2022

Calibration Date : 27 May 2022

Ambient Temperature : (26 ± 10) °C

Relative Humidity : (50 ± 30) %

Calibrated by :

Preecha Hahib

Approved by :

(/) Pornthippa Tameyakul
(/) Malee Buikrua
(/) Suwit Imjai

Issue Date :

2 June 2022

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

เอกสารไม่ควบคุม

Calibration Certificate

Certificate No.: 2201793-001-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road,
 Bangchack, Prakhnong, Bangkok 10260

Page 1 of 5

Equipment: pH Meter
Manufacturer: METTLER TOLEDO
Model: SevenEasy pH
Serial No.: 1231155210
ID No.: UAE.WAT.010/2553
Order No.: 2201793
Operation No.: 2201793-001
Date of Receipt: 21 February 2022
Date of Calibration: 1 March 2022

Calibrated by Mr.Pheraphat Tuanjit
 Scientist
Date of Issue: 1 March 2022
Approved by 
 Specialist, Division of Calibration Laboratory
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: 00 Date: 14-12-61



Equipment : Autoclave
Condition As-Received : Used Item
Reference : 2205-0764OC-2
Result of Calibration : (*) Without Adjustment

Operating parameter Set : Temperature = 115.0 °C
 Sterilization period = 15 minute

| UUC* Setting (°C) | UUC* Reading (°C) | Position | Average* Standard Reading (°C) | Stability (± °C) | Pressure Reading (MPa) | Uncertainty (± °C) | Coverage Factor k |
|-------------------|-------------------|----------|--------------------------------|------------------|------------------------|--------------------|-------------------|
| 115.0 | 115.0 | 1 | 115.553 | 0.4 | 0.08 | 0.82 | 2 |
| | | 2 | 115.582 | | | | |
| | | 3 | 115.325 | | | | |

Operating parameter Set : Temperature = 121 °C
 Sterilization period = 30 minute

| UUC* Setting (°C) | UUC* Reading (°C) | Position | Average* Standard Reading (°C) | Stability (± °C) | Pressure Reading (MPa) | Uncertainty (± °C) | Coverage Factor k |
|-------------------|-------------------|----------|--------------------------------|------------------|------------------------|--------------------|-------------------|
| 121.0 | 121.0 | 1 | 121.484 | 0.21 | 1.1 | 0.75 | 2 |
| | | 2 | 121.581 | | | | |
| | | 3 | 121.311 | | | | |

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

Calibration Report

Certificate No.: 2201793-001-01
Equipment: pH Meter
Resolution: 0.01 pH ; 1 mV
Manufacturer: METTLER TOLEDO
Model: SevenEasy pH
Serial No.: 1231155210
Type: Bench top
ID No.: UAE.WAT.0102553
Date of Calibration: 1 March 2022
Location: Chemical Calibration Laboratory, NATIONAL FOOD INSTITUTE

Page 3 of 5

Calibration Results:

1. Calibration of pH Meter (Manual Temperature Compensation at 25 °C)

| Nominal pH | DC Voltage Standard (mV) | Average Indicator Reading | | Uncertainty (mV) | Coverage Factor (k) |
|------------|--------------------------|---------------------------|-------|------------------|---------------------|
| | | mV | pH | | |
| 0.00 | 414.117 | 414 | 0.00 | 0.58 | 2.00 |
| 2.00 | 295.811 | 296 | 2.00 | 0.58 | 2.00 |
| 4.00 | 177.462 | 178 | 4.00 | 0.58 | 2.00 |
| 6.00 | 59.159 | 59 | 6.00 | 0.58 | 2.00 |
| 7.00 | -0.001 | 0 | 7.00 | 0.58 | 2.00 |
| 8.00 | -59.159 | -59 | 8.00 | 0.58 | 2.00 |
| 10.00 | -177.463 | -177 | 10.00 | 0.58 | 2.00 |
| 12.00 | -295.812 | -296 | 12.00 | 0.58 | 2.00 |
| 14.00 | -414.119 | -414 | 14.00 | 0.58 | 2.00 |

2. Calibration of pH Meter with Electrode (Manual Temperature Compensation at 25 °C)

Equipment: pH Electrode
Manufacturer: METTLER TOLEDO
Model: InLabSolds
ID No.: N/A

Performance of Electrode system

| Certified Value @25 °C (pH) | Average Indicator Reading | | Relative Slope (%) | Uncertainty (± pH) | Coverage Factor (k) |
|-----------------------------|---------------------------|------|--------------------|--------------------|---------------------|
| | pH | mV | | | |
| 4.008 | 4.00 | 180 | 96.25 | 0.0076 | 2.00 |
| 6.866 | 6.88 | 16 | - | 0.0079 | 2.00 |
| 10.012 | 10.01 | -162 | 96.13 | 0.0094 | 2.00 |
| 6.985 | 7.00 | 9 | - | 0.0097 | 2.00 |

Calibration Report

Certificate No.: 2201793-001-01
Equipment: pH Meter
Resolution: 0.01 pH ; 1 mV
Manufacturer: METTLER TOLEDO
Model: SevenEasy pH
Serial No.: 1231155210
Type: Bench top
ID No.: UAE.WAT.0102553
Date of Calibration: 1 March 2022
Location: Chemical Calibration Laboratory, NATIONAL FOOD INSTITUTE

Page 2 of 5

Calibration Results:

1. Calibration Method
2. Reference Standards / Certified Reference Material
3. This certification is traceable to The International System of Unit (SI Unit)

| Serial / ID No. | Manufacturer | Certificate No. | Due Date |
|-----------------|--------------|-----------------|-----------------|
| 2709007 | Fluke | SCL-21F-0687 | 24 June 2022 |
| 2709007 | Fluke | CC-640599-01 | 30 October 2022 |
| NFI.BTH00418 | PONPE | QR22-0195 | 27 January 2023 |

| Lot No. | Manufacturer | Ref. N | Expiry Date |
|---------|--------------|----------|---------------|
| 741339 | CPAchem | PH216.L5 | 19 April 2023 |
| 741340 | CPAchem | PH217.L5 | 19 April 2023 |
| 741342 | CPAchem | PH220.L5 | 19 April 2022 |
| 735836 | CPAchem | PH107.L5 | 18 March 2022 |

3.1 Instruments No.2.1 through
3.2 Instruments No.2.2 through
3.3 Instruments No.2.3 through
3.4 Certified Reference Material No. 2.4 to 2.6 traceable to
3.5 Certified Reference Material No. 2.7 traceable to
NSC-TIS-1715 17025 Laboratory Accreditation of Calibration No.0075
NSC-TIS-1715 17025 Laboratory Accreditation of Calibration No.0061
NSC-TIS-1715 17025 Laboratory Accreditation of Calibration No.0292
Primary measurement method- Harned cell using calibrated thermometer, barometer, and nanovoltmeter. The Standard Solution preparation and certified by CPAchem Ltd is accredited to ISO 17034 and ISO/IEC 17025
BIM ReN Hi-7 LoN 30.04.2020; BIM ReN Hi-9 LoN 28.05.2020; BIM ReN Hi-8 LoN 30.04.2020; BIM ReN Hi-10 LoN 28.05.2020. The Standard Solution preparation and certified by CPAchem Ltd is accredited to ISO 17034 and ISO/IEC 17025

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 Report

Page 5 of 5

Certificate No.: 2201793-001-01
Equipment: Digital Thermometer with RTD (pH Meter)
Resolution: 0.1 °C **Model:** SevenEasy pH
Serial No.: 1231155210 **ID No.:** UAE.WAT.010/2553
Manufacturer: METTLER TOLEDO
Date of Calibration: 1 March 2022

Calibration point: 15.0, 25.0 and 35.0 °C
Calibration result: The probe was immersed in liquid bath or dry bath to a minimum depth of 100 mm.
Description of probe, model: N/A S/N: N/A
Dimension of probe: Diameter 4 mm., Length 100 mm.,
Sheath material: Stainless Steel

| UUC* Reading (°C) | Standard Temperature (°C) | Correction Value (°C) | Uncertainty ± (°C) |
|-------------------|---------------------------|-----------------------|--------------------|
| 15.1 | 15.006 | -0.1 | 0.099 |
| 25.1 | 25.004 | -0.1 | 0.099 |
| 35.1 | 35.003 | -0.1 | 0.099 |

Note

- UUC* : Unit Under Calibration

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 *****

Calibration Report

Page 4 of 5

Certificate No.: 2201793-001-01
Equipment: Digital Thermometer with RTD (pH Meter)
Resolution: 0.1 °C **Model:** SevenEasy pH
Serial No.: 1231155210 **ID No.:** UAE.WAT.010/2553
Manufacturer: METTLER TOLEDO
Date of Calibration: 1 March 2022

Location: Chemical Calibration Laboratory, NATIONAL FOOD INSTITUTE
Environment Condition: Ambient Temperature 24 °C ± 1 °C
Relative Humidity 53 % ± 2 %

Condition of this results of Calibration:

1. Calibration Method :
 - In house method: W-TE-025 by comparison with standard thermometer.
 - The Calibration is determined by comparing with a known temperature from a standard resistance thermometer.
 - The temperature scale in use at this laboratory is the International Temperature scale of 1990 (ITS-90).
2. Reference Standard Instrument :

| Instrument | Model | Serial No. | Certificate No. | Due Date | Through |
|---------------------------------------|-------|------------|-----------------|-----------|---------|
| HANDHELD THERMOMETER | 1523 | 2118154 | PSL-T 0851/64 | 03-Jun-22 | TISTR |
| Platinum Resistance Thermometer (PRT) | 5627A | 877332 | | | |

Support Equipment : - Low Temperature Bath (ISOCAL-6), Model: Europa-6 Plus Basic, S/N: 341592/2

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

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

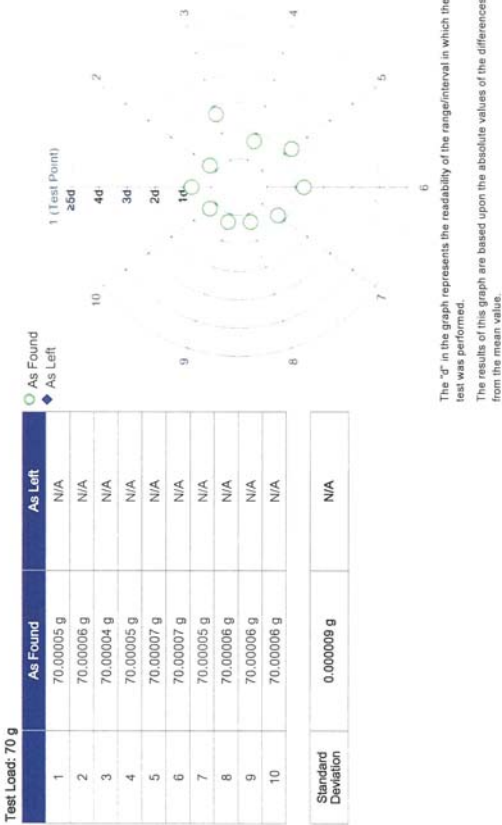
5. This result of calibration was found accurate as shown on date and place of calibration only.

6. Condition of Calibrated Item : Good

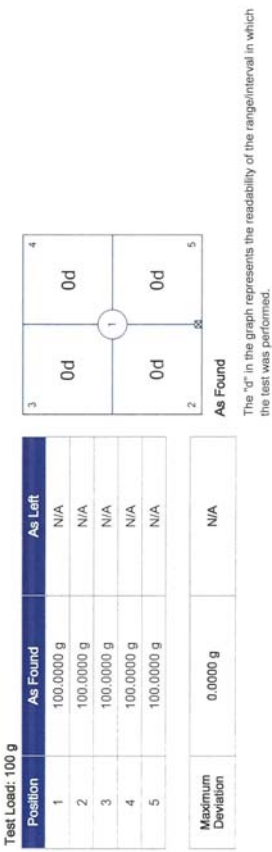
7. Result of Calibration : ☒ Without adjustment ☐ After adjustment

Measurement Results

Repeatability



Eccentricity



Mettler-Toledo (Thailand) Ltd.
846/4 - 846/5 Lasalle Rd., Bangna Tai Sub-District
Bangna District, Bangkok 10260
+66 2723 0382
MT-TH.ServiceSupport@mt.com

Accuracy Calibration Certificate

Customer

Company: United Analyst and Engineering Consultant Co., Ltd.
Address: 3 Soi Udom Suk 41, Sukhumvit Rd., Bang Chak
City: Phra Khanong
Zip / Postal: 10260
State / Province: Bangkok
Order Number: 03701927860
Contact: Suwit Chotnok

Weighing Device

Manufacturer: Mettler Toledo
Model: XSR205DU
Serial No.: C210685394
Building: N/A
Floor: 2
Room: Balance Room
Instrument Type: Weighing Instrument
Asset Number: UAE-WAO.010/2565
Terminal Model: SRAT
Terminal Serial No.: C210685394
Terminal Asset No.: N/A

Procedure

Calibration Guideline: EURAMET cg-18 v. 4.0 (11/2015)
Mettler Toledo Work Instruction: CPM002/20
This calibration certificate contains measurements for As Found calibration. No As Left calibration was performed because the device was not modified after As Found calibration. Therefore, results for As Left correspond to As Found.
The sensitivity/span of the weighing instrument was adjusted before calibration with a built-in weight.
In accordance with EURAMET cg-18 (11/2015), the test loads were selected to reflect the specific use of the weighing device or to accommodate specific calibration conditions.

| As Found | Start: 22.4 °C | End: 22.4 °C | Start: 47.5 % | End: 46.2 % |
|----------|----------------|--------------|---------------|-------------|
| | Temperature | | Humidity | |

As Found Calibration Date: 06-May-2022
As Left Calibration Date: N/A
Issue Date: 09-May-2022
Approved Signatory:

Remarks

- FACT adjustment functionality activated
- Equipment condition: Good
- Calibration after installation
- Next calibration according to customer's procedure
- Calibration data not decide by calibration laboratory

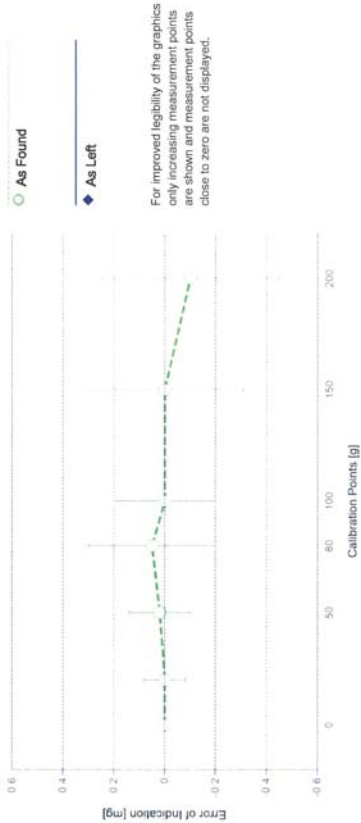
End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Error of Indication

| As Found | | | | |
|-----------------|-------------|---------------------|----------------------|---|
| Reference Value | Indication | Error of Indication | Expanded Uncertainty | k |
| 1 0.00000 g | 0.00000 g | 0.00000 g | 0.020 mg | 2 |
| 2 0.05000 g | 0.05001 g | 0.00001 g | 0.023 mg | 2 |
| 3 0.10001 g | 0.10001 g | 0.00000 g | 0.025 mg | 2 |
| 4 1.00000 g | 1.00001 g | 0.00001 g | 0.034 mg | 2 |
| 5 5.00001 g | 5.00001 g | 0.00000 g | 0.049 mg | 2 |
| 6 20.00002 g | 20.00002 g | 0.00000 g | 0.082 mg | 2 |
| 7 50.00000 g | 50.00002 g | 0.00002 g | 0.12 mg | 2 |
| 8 80.00004 g | 80.00009 g | 0.00005 g | 0.25 mg | 2 |
| 9 100.00000 g | 100.00000 g | 0.00000 g | 0.20 mg | 2 |
| 10 150.00000 g | 150.00000 g | 0.00000 g | 0.31 mg | 2 |
| 11 200.00000 g | 199.99999 g | -0.00001 g | 0.35 mg | 2 |

*The calculated uncertainty was replaced by the CMC (Calibration and Measurement Capabilities) value because the calculated uncertainty was smaller than the CMC value.



The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k – which can be larger than 2 according to EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

Weight Set 1: OIML E2

| | | | |
|---------------------|--------|-----------------------|-------------|
| Weight Set No.: | WS54 | Date of Issue: | 17-Nov-2020 |
| Certificate Number: | 170240 | Calibration Due Date: | 15-May-2022 |

Thermo Hygrometer

| | | | |
|---------------------|---------|-----------------------|-------------|
| Equipment No.: | IN161 | Date of Issue: | 14-Jun-2021 |
| Certificate Number: | 21H1220 | Calibration Due Date: | 01-Jun-2022 |



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
5344 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-27 FAX. 0-2719-9484



MAT
METROLOGY ASSOCIATION OF THAILAND
MEMBER OF THE INTERNATIONAL METROLOGICAL FEDERATION (BIPM)

Cert. No.: 22TM304
Page.: 1 of 3

Certificate of Calibration

Equipment : Hot Air Oven

Manufacturer : Memmert

Model : UF 55

Serial No. : B212.0411

ID No. : UAE.WAO.005/2556

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 : 7 April 2022

Calibration Date : 7 April 2022

Ambient Temperature : (26 ± 10) °C

Relative Humidity : (50 ± 30) %

Calibrated by : Man Pattanapongpaiboon

Approved by :

() Pornthippa Tameyakul
() Malee Butkruea
() Suwit Injai

Issue Date : 18 April 2022

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.

Measurement Uncertainty of the Weighing Instrument in Use

Stated is the expanded uncertainty with $k=2$ in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Temperature coefficient for the evaluation of the measurement uncertainty in use: $1.5 \cdot 10^{-6} / K$

Temperature range on site for the evaluation of the measurement uncertainty in use: 3 K

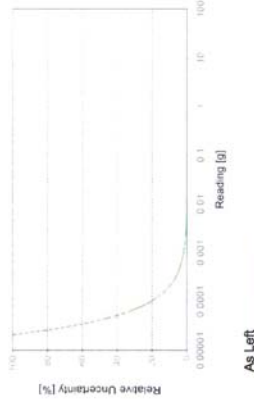
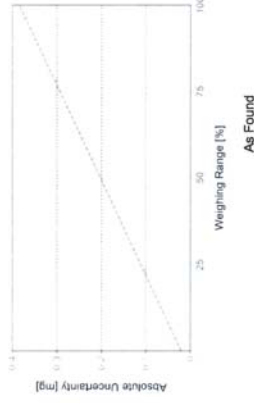
Linearization of Uncertainty Equation

| Range | | As Found | As Left |
|-------|-----------|----------|---------|
| d | Max | | |
| 1 | 0.00001 g | 81 g | N/A |
| 2 | 0.0001 g | 220 g | N/A |

To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

| Net Indication | As Found | As Left |
|----------------|----------|---------|
| 0.00220 g | 0.021 mg | N/A |
| 0.02200 g | 0.021 mg | N/A |
| 0.22000 g | 0.022 mg | N/A |
| 2.20000 g | 0.031 mg | N/A |
| 220.0000 g | 1.0 mg | N/A |



The weighing range shown in the absolute uncertainty graph refers to the first interval/range of the device.



Equipment : Hot Air Oven
 Condition As-Received : Used Item
 Reference : 2204-0015OC-1
 Result of Calibration :- (*) Without Adjustment
 Function of UUC* : Temperature Source
 Fresh air setting : Close

Cert. No.: 22TM304
 Page.: 3 of 3

| Calibration Point (°C) | UUC* Setting (°C) | UUC* Reading (°C) | Temperature stability (± °C) | Temperature uniformity (°C) | Overall Variation (°C) | Uncertainty (± °C) | Coverage Factor k |
|--------------------------|---------------------|---------------------|--------------------------------|-------------------------------|--------------------------|----------------------|-------------------|
| 104.0 | 104.0 | 104.0 | 0.040 | 0.57 | 0.80 | 0.42 | 2 |
| 120.0 | 120.0 | 120.0 | 0.11 | 0.82 | 1.1 | 1.1 | 2 |
| 180.0 | 180.0 | 180.0 | 0.12 | 1.4 | 2.0 | 1.1 | 2 |

| Calibration Point (°C) | Measured Temperature (°C) | | | | | | | |
|--------------------------|-----------------------------|---------|---------|---------|---------|---------|---------|---------|
| | Position | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 104.0 | 104.403 | 104.220 | 104.517 | 104.474 | 103.778 | 103.859 | 104.292 | 104.357 |
| 120.0 | 120.183 | 119.878 | 120.238 | 120.355 | 119.476 | 119.455 | 120.046 | 120.173 |
| 180.0 | 180.502 | 179.929 | 180.655 | 180.797 | 179.012 | 179.044 | 180.043 | 180.305 |

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 %.

-o0o-



Equipment : Hot Air Oven
 Condition As-Received : Used Item
 Reference : 2204-0015OC-1
 Procedure Used :-

Cert. No.: 22TM304
 Page.: 2 of 3

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD) and Thermocouple Type T.

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

| | | | | |
|----------------------|--------------|-------------------|------------------|-----------------|
| Instrument | Model | Serial No. | Cert. No. | Due Date |
| 1) Data Acquisition | 34970A | MY41021843 | 22LM4 | 10 Jan 2023 |

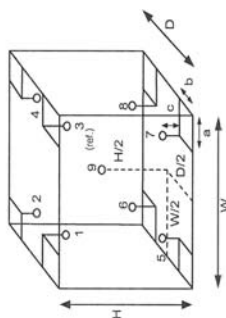
2. This certificate is valid only to the item calibrated on date and place of calibration.

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

Result of Calibration:- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close



Probe Installation Details :

| | | | | | |
|-----|-----|----|------------|------|----|
| a = | 5.0 | cm | D = | 0.50 | m |
| b = | 5.0 | cm | W = | 0.80 | m |
| c = | 5.0 | cm | H = | 0.75 | m |
| | | | Capacity = | 0.30 | m³ |

Dimension of Chamber :

| Environment during calibration | | |
|--------------------------------|-----------|----------|
| Temp. (°C) | Beginning | Finished |
| REL.Humid. (%) | 28 | 28 |
| AC Supply (Volt) | 56 | 55 |
| | 221 | 224 |

| Ref. Std. ID No.: @ | | |
|---------------------|--------------|-------------|
| Position : | (120 ,180) | (104) |
| 1 | 21-04TC-01 | 18-04RTD-01 |
| 2 | 21-04TC-02 | 18-04RTD-02 |
| 3 | 21-04TC-03 | 18-04RTD-03 |
| 4 | 21-04TC-04 | 18-04RTD-04 |
| 5 | 21-04TC-05 | 18-04RTD-05 |
| 6 | 21-04TC-06 | 18-04RTD-06 |
| 7 | 21-04TC-07 | 18-04RTD-07 |
| 8 | 21-04TC-08 | 18-04RTD-08 |
| 9 (ref.) | 21-04TC-09 | 18-04RTD-09 |

Calibration Report

Certificate No.: 2202934-001-01

Equipment: Electronic Balance

Model: XSR204

Serial No.: C117635043

Capacity: 220 g

Manufacturer: METTLER TOLEDO

Resolution: 0.0001 g

ID No.: UAE.WAS.012/2564

Capacity: 220 g

Date of Calibration: 13 May 2022

Page 2 of 4

| Environment Condition: | Ambient Temperature | 22.3 ± 0.1 °C | Relative Humidity: | 47 ± 3 % |
|------------------------|---------------------|---------------|--------------------|----------|
|------------------------|---------------------|---------------|--------------------|----------|

Place of Calibration: Balance room (Water Analysis Unit), UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.

Condition of Equipment Good Condition

Condition of This Results of Calibration:

- | Reference Standard | Model | Serial No | Calibrated By | Certificate No. | Due Date |
|--------------------------|-------------|---------------|----------------|-----------------|------------------|
| Standard Weight Class E2 | 1mg to 200g | 8505567572 | TCS | M22041375 | 23 April 2023 |
| Instrument | Model | Serial No | Calibrated By | Certificate No. | Due Date |
| Thermo-Hygro Meter | PONPE 490 | NFLBTH 010/18 | Quality Reborn | QR22-0350 | 18 February 2023 |
1. Calibration Method: NFI Method W-Na-001 In-House Method based on UKAS Lab 14 : 2019
 2. Reference Standards:
 1. This certificate was certified only for the instrument we calibrated.
 2. This result of calibration was found accurate as shown on date and place of calibration only.

Calibration Results:

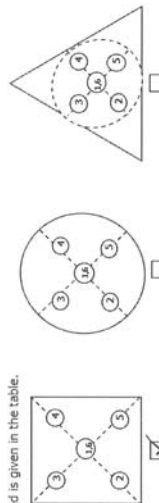
1. Repeatability of Reading:

| Nominal Value (g) | Standard Deviation of Reading (g) |
|---------------------|-------------------------------------|
| 100 | 0.000033 |
| 200 | 0.000032 |

2. Off-Center Error:

A mass of 50 g was placed and moved to various position on pan.

The balance reading obtained is given in the table.

[illegible]

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

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





Equipment : BOD Incubator
Condition As-Received : Used Item
Reference : 2202-0446OC-1

Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 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 | Model | Serial No. | Cert. No. | Due Date |
|----------------------|--------|------------|-----------|-------------|
| 1) Data Acquisition | 34970A | MY44035217 | 21LM30 | 23 Dec 2022 |

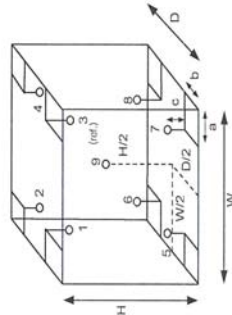
2. This certificate is valid only to the item calibrated on date and place of calibration.

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

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Not Available



Probe Installation Details :

| | a | b | c |
|------------|-------|-------|---------------------|
| a = | 10 cm | | |
| b = | 10 cm | 1.2 m | |
| c = | 10 cm | 1.2 m | |
| Capacity = | | | 0.89 m ³ |

Dimension of Chamber :

| | |
|------------|---------------------|
| D = | 0.62 m |
| W = | 1.2 m |
| H = | 1.2 m |
| Capacity = | 0.89 m ³ |

| Position : | Ref. Std. ID No.: |
|------------|-------------------|
| 1 | 18-10RTD-01 |
| 2 | 18-10RTD-02 |
| 3 | 18-10RTD-03 |
| 4 | 18-10RTD-04 |
| 5 | 18-10RTD-05 |
| 6 | 22-10RTD-10 |
| 7 | 18-10RTD-07 |
| 8 | 18-10RTD-08 |
| 9 (ref.) | 18-10RTD-09 |

| Environment during calibration | | |
|--------------------------------|-----------|----------|
| | Beginning | Finished |
| Temp. (°C) | 28 | 28 |
| REL Humid. (%) | 68 | 75 |
| AC Supply (Volt) | 226 | 226 |



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-27 FAX. 0-2719-9484



Cert. No.: 22TM90
Page.: 1 of 3

Certificate of Calibration

| | |
|------------------------------|--|
| 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 : | 17 February 2022 |
| Calibration Date : | 17 February 2022 |
| Ambient Temperature : | (26 ± 10) °C |
| Relative Humidity : | (50 ± 30) % |
| Calibrated by : | Kunchit Promprat |
| Approved by : | <div></div> Approved Signatory |
| Issue Date : | 22 February 2022 |

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.

Verification Certificate

Certificate No.: 2202361-001-01
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: HEATING BLOCK DIGESTION

Manufacturer: FOSS

Model: 2520

Serial No.: 91794469

ID No.: UAE.WAS.011/2560

Order No.: 2202361

Operation No.: 2202361-001

Date of Receipt: 4 April 2022

Date of Calibration: 4-6 April 2022

Calibrated by Mr.Nuttapol Niyomchat **Approved by**  (Manager, Division of Calibration Laboratory)
 Specialist
Date of Issue: 11 April 2022
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 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: 00 Date: 14-12-61



Equipment: BOD Incubator
Condition As-Received: Used Item
Reference: 2202-0446OC-1

Cert. No.: 22TM90
Page.: 3 of 3

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Not Available

| Calibration Point (°C) | UUC* Setting (°C) | UUC* Reading (°C) | Temperature stability (± °C) | Temperature uniformity (°C) | Overall Variation (°C) | Uncertainty (± °C) | Coverage Factor k |
|-----------------------------|-------------------|-------------------|------------------------------|-----------------------------|------------------------|--------------------|-------------------|
| 20.0 | 19.5 | 19.4 | 0.30 | 0.58 | 1.0 | 0.55 | 2 |
| Measured Temperature (°C) | | | | | | | |
| Position | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 20.154 | 20.013 | 20.356 | 19.939 | 19.834 | 19.761 | 19.817 | 19.824 |
| | | | | | | 9 (ref.) | 19.922 |

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 %.

-o0o-

Verification Report

Certificate No.: 2202361-001-01
Equipment: HEATING BLOCK DIGESTION
Model: 2520 Serial No.: 91794469
Resolution: 1 °C ID No.: UAE.WAS.011/2560
Manufacturer: FOSS
Date of Calibration: 4-6 April 2022 380 °C

Page 3 of 4

Calibration point:

Calibration result:

Reporting of Temperature

| Block No. | UUC* Setting (°C) | UUC* Reading (°C) | Stability (±°C) | Standard Thermometer (°C) | Uncertainty (±°C) |
|-----------|-------------------|-------------------|-----------------|---------------------------|-------------------|
| 1 | 380 | 380 | 0.13 | 376.48 | 1.5 |
| 2 | 380 | 380 | 0.12 | 376.58 | 1.5 |
| 3 | 380 | 380 | 0.12 | 376.51 | 1.5 |
| 4 | 380 | 380 | 0.14 | 376.70 | 1.6 |
| 5 | 380 | 380 | 0.18 | 376.81 | 1.6 |
| 6 | 380 | 380 | 0.12 | 377.23 | 1.6 |
| 7 | 380 | 380 | 0.12 | 377.37 | 1.5 |
| 8 | 380 | 380 | 0.13 | 376.68 | 1.5 |
| 9 | 380 | 380 | 0.14 | 376.72 | 1.5 |
| 10 | 380 | 380 | 0.18 | 378.97 | 1.6 |
| 11 | 380 | 380 | 0.25 | 378.79 | 1.6 |
| 12 | 380 | 380 | 0.11 | 377.14 | 1.6 |
| 13 | 380 | 380 | 0.19 | 379.65 | 1.6 |
| 14 | 380 | 380 | 0.16 | 379.61 | 1.6 |
| 15 | 380 | 380 | 0.16 | 378.66 | 1.6 |
| 16 | 380 | 380 | 0.15 | 379.18 | 1.6 |
| 17 | 380 | 380 | 0.23 | 377.39 | 1.6 |
| 18 | 380 | 380 | 0.11 | 377.71 | 1.6 |
| 19 | 380 | 380 | 0.22 | 376.64 | 1.6 |
| 20 | 380 | 380 | 0.16 | 376.56 | 1.6 |

Note:

- UUC* = Unit Under Calibration

- Immersion depth of standard thermometer in tube level high of sand is equal heater plate of UUC.

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

Verification Report

Certificate No.: 2202361-001-01
Equipment: HEATING BLOCK DIGESTION
Model: 2520 Serial No.: 91794469
Resolution: 1 °C ID No.: UAE.WAS.011/2560
Manufacturer: FOSS
Date of Calibration: 4-6 April 2022

Page 2 of 4

Location:

Laboratory Room, NATIONAL FOOD INSTITUTE

Environment Condition:

Ambient Temperature (25 ± 3) °C
Relative Humidity (55 ± 15) %
Line Voltage (220 ± 10) Volt

Condition of this results of Calibration:

1. This instrument was calibrated by insert standard thermocouples type R into its heating block digestion and compared to temperature obtained from reference standards thermometer at calibrated point.
- 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 Thermocouple | 34970A/34901A Type R | MY40405576/MY41194453 TC#101-103 / CH#101-103 | TC21/0041 | 24-Apr-2022 | N.M. Technical Center Laboratory |

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 - Hour 30 Minute At 380 °C

7. Result of Calibration : ☒ Without adjustment ☐ After adjustment

Customer Service Report

Date: 30/11/21
 Customer: UAE
 Instrument: KT200

Hours
 Start 8.00
 Finish 9.00

Travel To Customer
 8.00
 19.00

Labour
 19.00
 15.00

Travel From Customer
 19.00
 15.00

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

Report No: 5874

Address: 91 11/11/21
 200000 200000 200000 200000
 Serial: 91790529

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

PO/Quote Number: If applicable

PMA Type: FOSS cover PMO Contract No. If applicable

| Details of Work / Test | Condition / Status |
|------------------------------|--------------------|
| - Check instrument for KT200 | Pass |
| - Check safety valve | Pass |
| - Check rubber gasket | Pass |
| - Check heating element | Pass |
| - Check new panel PCB | Pass |
| - Check safety glass | Pass |
| - Check clean | Pass |
| - Check new package | Pass |
| - Check volume | Pass |
| - Check volume | Pass |

| Part No: | Batch | Description | Qty |
|-----------|-----------|---------------------------|-----|
| 100000000 | 11235-983 | Foss PM KIT KT200 | 1 |
| 157500000 | 20.07.21 | Safety Valve | 1 |
| 157500000 | 09.11.20 | Rubber Gasket for Heating | 2 |
| 100000000 | 02.08.21 | Heating Element | 1 |
| 100000000 | 16.11.20 | Safety | 1 |
| 100000000 | 16.11.20 | KT200 new panel PCB | 1 |
| 100000000 | 22.04.21 | Safety New complete | 1 |

I confirm this report is accurate and complete

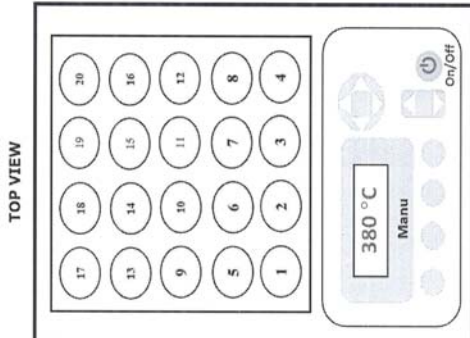
Signed FOSS: [Signature]
 Name: [Name]
 Signed Customer: [Signature]
 Name: [Name]
 Email: [Email]

Would you be willing to participate in a brief survey in order to tell us how we performed?

Verification Report

Certificate No.: 2202361-001-01
 Equipment: HEATING BLOCK DIGESTION
 Model: 2520 Serial No.: 91794469
 Resolution: 1 °C ID No.: UAE.WAS.011/2560
 Manufacturer: FOSS
 Date of Calibration: 4-6 April 2022
 Calibration point: 380 °C
 Calibration result: Continued

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



Sensor Installation Location

- Note:
- UUC* = Unit Under Calibration
 - Immersion depth of standard thermometer in tube level high of sand is equal heater plate of UUC.
 - Stability = One-half of the greatest maximum difference of measured temperatures at one sensors, for at least half an hour after reaching steady state.

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor of approximately 95 %.

----- End -----

FOSS Preventive Maintenance Protocol

Maintenance Procedure

Exchange of Parts and Cleaning

| Step | Action | Part | P/N | OK |
|------|-------------------------------|------------------------------|-----------|--------------------------|
| 1 | Replace | Adapter for dig. tube 250 ml | 1000 0056 | <input type="checkbox"/> |
| 2 | Replace | Non return valve | 1000 3538 | <input type="checkbox"/> |
| 3 | Replace valves in alkali pump | Valve kit reagent/water pump | 1575 0093 | <input type="checkbox"/> |
| 4 | Replace steam tubing | Silicone tubing 8/12 mm | 1582 0006 | <input type="checkbox"/> |
| 5 | Replace alkali tubing | Tubing reinforced for alkali | 1582 0011 | <input type="checkbox"/> |
| 6 | Replace water tubing | Tubing PVC 8/11 mm | 1582 0004 | <input type="checkbox"/> |
| 7 | Cleaning | Steam generator | | <input type="checkbox"/> |
| 8 | Cleaning | Splash head | | <input type="checkbox"/> |

Check and Adjustments

| Step | Action | Module | Measured | Limits | OK |
|------|---|-------------|----------|--------------------|-------------------------------------|
| 1 | Check alkali volume, 10 ml/stroke | Alkali pump | 48 98 | At 50 ml -0/+3 ml | <input checked="" type="checkbox"/> |
| 2 | Check distillation volume | | 120 ml | 100 – 150 ml/4 min | <input checked="" type="checkbox"/> |
| 3 | Check front panel switches | | | | <input checked="" type="checkbox"/> |
| 4 | Check cables and electrical connections | | | | <input checked="" type="checkbox"/> |
| 5 | Check level pins in steam generator | | | | <input checked="" type="checkbox"/> |
| 6 | Check safety door switch | | | | <input checked="" type="checkbox"/> |

Customer: UAE

| | | |
|---|---|--|
| Instrument | Kjeltect™ 2100 = 4 th Dec 2000 | |
| Recommended PM interval (whichever occurs first between interval and no. of samples analysed) | 12 months | No. of samples analysed (if applicable): |
| Preventive maintenance kit (P/N) | 10009965 | S/N 01790524 |

Introduction

A maintenance protocol provides systematic and functional means of maintaining a specific instrument type. The recommended PM interval depends on the operational conditions and is based on our extensive experience and knowledge of manufacturing and maintaining analytical instruments.

Apart from sample throughput, the environmental conditions also need to be considered. A demanding environment, such as high ambient temperature, humidity, dirtiness etc can measurably shorten component lifetime and also the maintenance and component replacement intervals.

NOTE!

The content of this protocol is subject to change over time. In order to safeguard that you obtain the correct parts, please make sure to indicate serial no and date of installation when contacting your FOSS representative.

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