

ANALYTICAL BALANCE (DU)

Model : XS205 DU

Serial No. : 1126323724

Mettler-Toledo (Thailand) Ltd.
846/4 - 846/5 Lualaba Rd., Bangna Tai Sub-District
Bangna District, Bangkok 10260
+66 2723 0392
MT-TH ServiceSupport@mt.com



Accuracy Calibration Certificate

Customer

Company: EASTERN THAI CONSULTING 1992 CO., LTD.
Address: 683 Moo 11, Sukhaphiban 8 Rd., Nong Kham
City: Sriracha Contact: Sasiporn Nakin
Zip / Postal: 20230
State / Province: Chonburi
Order Number: 4 8 3 3 3 4 4 3 0 *



Weighing Device

Manufacturer:	Mettler Toledo	Instrument Type:	Weighting Instrument
Model:	XS205DU	Asset Number:	LAGE 05/1
Serial No.:	1126323724	Terminal Model:	SAT
Building:	Laboratory	Terminal Serial No.:	1126323724
Floor:	1	Terminal Asset No.:	N/A
Room:	Laboratory		

Range	Max Capacity	Readability (g)
1	81 g	0.00001 g
2	220 g	0.0001 g

Procedure

Calibration Guideline:

METTLER TOLEDO Work Instruction:

EURAMET cp-18 v. 4.0 (11/2015)
CPW000270

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 cp-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	Temperature		Humidity	
	Start: 24.9 °C	End: 25.7 °C	Start: 54.0 %	End: 51.3 %

As Found Calibration Date: 07-Feb-2022

As Left Calibration Date: N/A

Issue Date: 08-Feb-2022

Calibrator: Sathaporn T

Sathaporn Talsen

Approved Signatory:

Kassakorn Tassamachaisakul

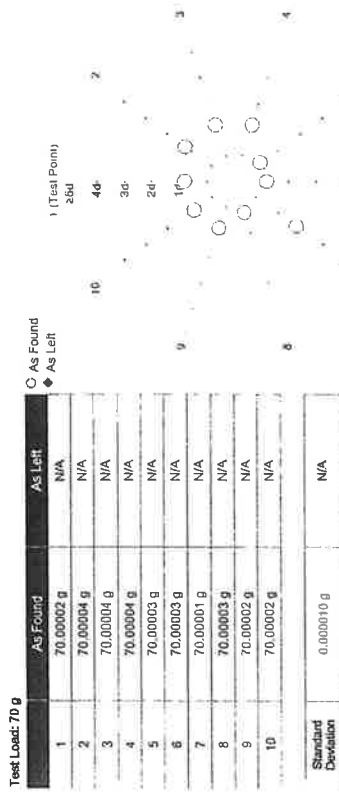
Santi Jinyom

Surachet Sukkale

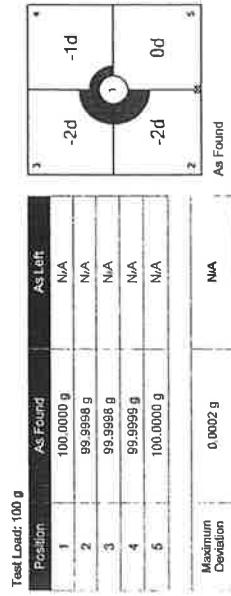


Measurement Results

Repeatability



Eccentricity



Remarks

FACT adjustment functionality activated
Equipment condition: Good
Next calibration: according to customer's procedure

End of Accredited Section

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

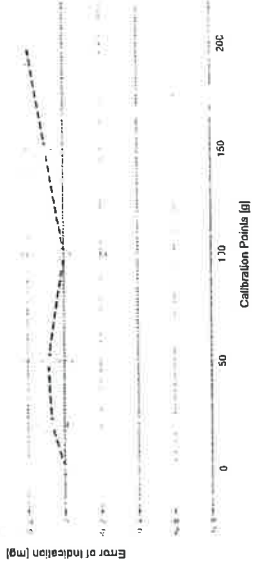
Error of Indication

As Found	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0.00000 g	0.00000 g	0.00000 g	0.021 mg	2
2	0.01000 g	0.01002 g	0.00002 g	0.023 mg	2
3	0.10000 g	0.10002 g	0.00002 g	0.026 mg	2
4	1.00000 g	1.00000 g	0.00000 g	0.035 mg	2
5	4.99999 g	4.99999 g	0.00000 g	0.050 mg	2
6	10.00002 g	10.00005 g	0.00003 g	0.063 mg	2
7	19.99994 g	20.00001 g	0.00007 g	0.085 mg	2
8	49.99997 g	50.00006 g	0.00009 g	0.13 mg	2
9	100.00000 g	100.00000 g	0.00000 g	0.23 mg	2
10	149.99999 g	150.00000 g	0.00001 g	0.35 mg	2
11	200.00000 g	200.00002 g	0.00002 g	0.42 mg	2

As Found

As Left

For improved legibility of the graphics only increasing measurement points are shown and measurement points close to zero are not displayed.



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.:	WS32	Date of Issue:	15-Sep-2020
Certificate Number:	169521	Calibration Due Date:	13-Mar-2022
Thermo Buro Hygrometer			
Equipment No.:	IN74	Date of Issue:	09-Jul-2021
Certificate Number:	21H1470	Calibration Due Date:	28-Jun-2022

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: $1.5 \cdot 10^{-4} / K$
Temperature range on site for the evaluation of the measurement uncertainty in use: $5 K$

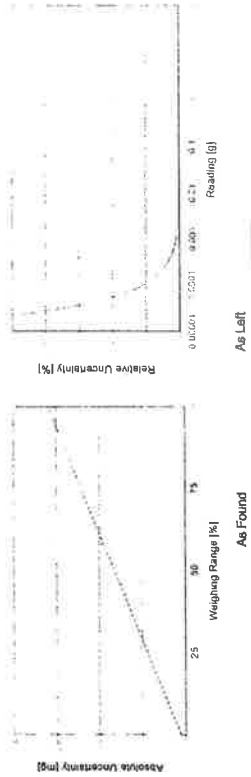
Linearization of Uncertainty Equation

	Range		As Found	As Left
	g	Max.		
1	0.00001 g	81 g	$U_1 = 0.022 \text{ mg} + 0.00763 \text{ mg/g} \cdot R$	N/A
2	0.0001 g	220 g	$U_2 = 0.06 \text{ mg} + 0.00762 \text{ mg/g} \cdot R$	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	0.022 mg	N/A
0.02200 g	0.022 mg	N/A
0.22000 g	0.024 mg	N/A
2.20000 g	0.039 mg	N/A
22.00000 g	1.7 mg	N/A



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

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Certificate

As Found



As Left



The weighing device meets the given process requirements.

The weighing device meets the given process requirements.

Tests Performed:

☒ As Found

☐ As Left

☒ No adjustments/modifications made. As Left results correspond to As Found.

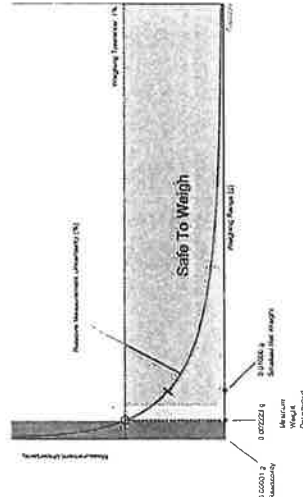
Process Requirements

Weighing Tolerance: 1 %

Smallest Net Weight: 0.01000 g

Safety Factor: 2

Safe Weighing Range



While the values in the graph reflect the actual calibration results, the measurement uncertainty curves are simply a visual representation. This graph reflects As Left testing, unless only As Found was performed.

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Measurement Results

Results Summary

As Found	Repeatability	Eccentricity	Error of Indication
As Left	✓	✓	✓

✓ = Passed
✗ = Failed
N = Safety Factor not met

Repeatability

Test Load: 70 g

Tolerance	Control Limit	As Found	Std. Deviation	Result	As Left	Std. Deviation	Result
0.1%	0.000005 g			✗			✗
0.2%	0.000010 g			✓			N
0.5%	0.000025 g			✓			✓
1%	0.000050 g		0.000010 g	✓		0.000010 g	✓
2%	0.000100 g			✓			✓
5%	0.000250 g			✓			✓

The weighing tolerance is met if the standard deviation is less than or equal to the corresponding control limit.

Eccentricity

Test Load: 100 g

Tolerance	Control Limit	As Found	Deviation	Result	As Left	Deviation	Result
0.1%	0.0500 g			✓			✓
0.2%	0.1000 g			✓			✓
0.5%	0.2500 g			✓			✓
1%	0.5000 g		0.0002 g	✓		0.0002 g	✓
2%	1.0000 g			✓			✓
5%	2.5000 g			✓			✓

The weighing tolerance is met if the deviation is less than or equal to the corresponding control limit.

Minimum Weight

As Found Minimum Weight Table

Range 1

Minimum weights for different weighing tolerances and safety factors					
Tolerance	1	2	3	5	10
0.1%	0.022382 g	0.045110 g	0.068193 g	0.115457 g	0.240445 g
0.2%	0.011148 g	0.022382 g	0.033702 g	0.056607 g	0.115457 g
0.5%	0.004449 g	0.008912 g	0.013368 g	0.022382 g	0.045110 g
1%	0.002223 g	0.004449 g	0.006679 g	0.011148 g	0.022382 g
2%	0.001111 g	0.002223 g	0.003335 g	0.005563 g	0.011148 g
5%	0.000444 g	0.000889 g	0.001333 g	0.002223 g	0.004449 g

The minimum weight table applies to the line range of the weighing device.

✓ Pass: The determined minimum weight meets the requirement for the smallest net weight.

As Left Minimum Weight Table

Range 1

Minimum weights for different weighing tolerances and safety factors					
Tolerance	1	2	3	5	10
0.1%	0.022382 g	0.045110 g	0.068193 g	0.115457 g	0.240445 g
0.2%	0.011148 g	0.022382 g	0.033702 g	0.056607 g	0.115457 g
0.5%	0.004449 g	0.008912 g	0.013368 g	0.022382 g	0.045110 g
1%	0.002223 g	0.004449 g	0.006679 g	0.011148 g	0.022382 g
2%	0.001111 g	0.002223 g	0.003335 g	0.005563 g	0.011148 g
5%	0.000444 g	0.000889 g	0.001333 g	0.002223 g	0.004449 g

The minimum weight table applies to the line range of the weighing device.

✓ Pass: The determined minimum weight meets the requirement for the smallest net weight.

At these net minimum weight values, the measurement uncertainty of the weighing device is equal to or less than 1/1 (no safety factor), 1/2, 1/3, 1/5, or 1/10 of the required tolerance. The values are calculated with $k = 2$ and based on the linear formula of the measurement uncertainty of the weighing device in use.

The safety factor for As Found is always 1. This implies no safety factor. As Found testing looks at the behavior of the instrument from the past until test occurred. For the past, it is necessary to know that the tolerance was met, but not the safety factor. The safety factor is a proactive measure to apply for future measurements.

Notes on minimum weight values in above table:

1. If "N/A" is shown above, no appropriate value could be calculated.
2. METTLER TOLEDO is not responsible for the definition of the process requirements.

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METTLER TOLEDO Service

Error of Indication

As Found

Reference Value	Error	Control limits for various weighing tolerances					Result
		0.1%	0.2%	0.5%	1%	2%	
0.00000 g	0.00000 g	N/A	N/A	N/A	N/A	N/A	5%
19.99994 g	0.00007 g	0.01000 g	0.02000 g	0.05000 g	0.10000 g	0.20000 g	0.50000 g
49.99987 g	0.00009 g	0.02500 g	0.05000 g	0.12500 g	0.25000 g	0.50000 g	1.25000 g
100.00000 g	0.00005 g	0.05000 g	0.10000 g	0.25000 g	0.50000 g	1.00000 g	2.50000 g
149.99999 g	0.00001 g	0.07500 g	0.15000 g	0.37500 g	0.75000 g	1.50000 g	3.75000 g
200.00000 g	0.00002 g	0.10000 g	0.20000 g	0.50000 g	1.00000 g	2.00000 g	5.00000 g
Result		✓	✓	✓	✓	✓	✓

As Left

Reference Value	Error	Control limits for various weighing tolerances					Result
		0.1%	0.2%	0.5%	1%	2%	
0.00000 g	0.00000 g	N/A	N/A	N/A	N/A	N/A	5%
19.99994 g	0.00007 g	0.01000 g	0.02000 g	0.05000 g	0.10000 g	0.20000 g	0.50000 g
49.99987 g	0.00009 g	0.02500 g	0.05000 g	0.12500 g	0.25000 g	0.50000 g	1.25000 g
100.00000 g	0.00005 g	0.05000 g	0.10000 g	0.25000 g	0.50000 g	1.00000 g	2.50000 g
149.99999 g	0.00001 g	0.07500 g	0.15000 g	0.37500 g	0.75000 g	1.50000 g	3.75000 g
200.00000 g	0.00002 g	0.10000 g	0.20000 g	0.50000 g	1.00000 g	2.00000 g	5.00000 g
Result		✓	✓	✓	✓	✓	✓

The weighing tolerance is met if the error (of indication) for each test point is less than or equal to the corresponding control limit for that particular weighing tolerance. Results at or close to the zero point cannot be assessed.

METTLER TOLEDO

Service Date: 2022-02-07
Document Number: TH4004-020-020722-LABBalanceHR
EASTERN THAI CONSULTING 1982 CO., LTD.
883 Moo 11, Sukhaphiban 8 Rd., Nong Kham, Sriracha, Chonburi 20230
Khun Sasiporn Nakin

Balance Health Report

Device Details		System Details	
Manufacturer:	Mettler Toledo	Accessory 1:	Other
Model:	XS205DU	Accessory 2:	
Serial number:	1126323724	Weight set for routine testing:	No
Firmware:	4.0		
History		Service History	
Instrument in use:	Yes	Last preventive maintenance:	< 1 year
Instrument age:	3-10 years	Last instrument calibration:	< 1 year
Spare parts available:	Yes	Last minimum weight determination:	Never
Regulations:	ISO	Routine testing performed:	Don't know
Process tolerance in %:	1 %		
Smallest sample net weight:	0.0100 g		
Check List			
Environmental Conditions		General & Functional Checks	
Room temperature fluctuation	✓	Leveling	✓
Exposure to direct sun	✓	Clearances	✓
Vibrations	✓	Completeness - missing parts see additional remarks	✓
Draft	✓	Settings optimized for operating environment	✓
Dirt or dust	✓	Other - objections noted as additional remarks	✓
Static	✓	Electrical Component Checks	
Mechanical Component Checks		Power supply	✓
Drift shield	✓	Sliding door drive	✓
Weighing pan position	✓	Internal weight drive	✓
Housing	✓	Display	✓
Other - objections noted as additional remarks	✓	Other - objections noted as additional remarks	✓
Recommendations			
Maintenance Periods & Quality		Process Efficiency	
Instrument calibration	Uninstall instrument		
Identify safe weighing range	Replace instrument		
GWP verification / risk assessment	Yes	Replace / add parts (see additional remarks)	
Preventive maintenance		Onsite repair	
Perform routine testing with test weights		Depot repair	
User training		Use of accessories (see additional remarks)	
Contact	Name: Khun Sasiporn Nakin	Position: Document Control	Phone: 086-051-3303
			Email: ac.lao@mettler.com
Additional Remarks & Recommendations			
		Engineer Details	
		Date:	07-Feb-2022
		Name:	Sasiporn Talsen
		Signature:	

This is not a certificate.
It should not be used to interpret final results for the testing of these devices.

Legend: ✓ Good/Pass ↓ Needs Attention X Bad/Fail — Not Applicable

8894 - 8462 Lesau Rd., 8th Floor, 1st Sub-District, Bangkok District Bangkok 10260 - 66 2723 0342
METTLER TOLEDO Support@mettler.com
www.mt.com

Report Version: 1.13, Software Version: 4.27.0.9, Page: 1/1, © METTLER TOLEDO

ANALYTICAL BALANCE

Model : SECURA224-1S

Serial No. : 0036707137



Certificate No. : 22-011768
Sample Code : 22-04498-005

Page 1 of 4

CERTIFICATE OF CALIBRATION

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.
683 Moo 11, Sukhapiban 8 Rd., Nongkham,
Sriracha, Chonburi 20230

Location of Calibration : EASTERN THAI CONSULTING 1992 CO., LTD.
(Analytical Balance Room)

Equipment : ELECTRONIC BALANCE

Manufacturer : SARTORIUS

Model : SECURAZ224-1S

Serial No. : 0036707137

ID No. : LABE 05/2

Date of Receipt : 03 February 2022

Date of Calibration : 03 February 2022

Calibrated by : Mr. Thanadol Pholthep
Scientist

Issue date : 07 February 2022

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

The calibration result is applied only to the above calibrated item and was found accurate as shown on date and place of calibration only.

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 unit 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 Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC).



Certificate No. : 22-011768
Sample Code : 22-04498-005

Page 2 of 4

REPORT OF CALIBRATION

Equipment : ELECTRONIC BALANCE
Manufacturer : SARTORIUS
Model : SECURAZ224-1S
Capacity : Max 220 g
Resolution : 0.0001 g
Serial No. : 0036707137
ID No. : LABE 05/2

Result of Calibration

1. Test weight and repeatability of reading

Repeatability is a measure of the ability of a balance to supply the same result in repetitive weighings with one and the same load under the same measurement condition. The measurement of the repeatability must include both the balance specifications and the ambient (vibration, fluctuating air current/temperature/humidity, etc.) Operator handling of the balance is also included in the standard deviation.

Unit : g	Range : 220	<input checked="" type="checkbox"/> Before adjustment	<input checked="" type="checkbox"/> After adjustment
<input type="checkbox"/> No adjustment	Nominal value	100	200
<input checked="" type="checkbox"/> Adjustment	Standard weight	100.000022	200.000022
	Average reading of indicator	99.9998	199.9998
	Standard deviation	0.00009	0.00005

Unit : - Range : - ☐ Before adjustment ☐ After adjustment

<input type="checkbox"/> No adjustment	Nominal value	-	-
<input type="checkbox"/> Adjustment	Standard weight	-	-
	Average reading of indicator	-	-
	Standard deviation	-	-

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Certificate No. : 22-011768

Sample Code : 22-04498-005

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REPORT OF CALIBRATION

Result of Calibration

2. Sensitivity or value of a scale division

Change in the output variable of a measuring instrument divided by the associated change in the input variable.

Unit : g

Range :		Range :	
Test Point	Sensitivity, S	Test Point	Sensitivity, S
0	0.7981	-	-
100	0.9976	-	-
200	0.9976	-	-

3. Departure of indication from nominal value, Linearity

Unit : g

Nominal Value	Standard Value	Average Reading of Indicator	Correction Value	Expanded Uncertainty	Coverage Factor (k)
Unload	0.0000000	0.0000	0.0000	0.000094	2.01
0.01	0.0100045	0.0100	0.0000	0.000094	2.01
0.1	0.1000102	0.1000	0.0000	0.000094	2.01
1	1.0000055	1.0000	0.0000	0.000095	2.01
2	2.0000144	1.9999	0.0001	0.000095	2.01
5	5.0000060	5.0000	0.0000	0.000096	2.01
10	10.000007	9.9999	0.0001	0.000097	2.01
20	20.000022	20.0000	0.0000	0.00010	2.01
50	50.000038	50.0000	0.0000	0.00012	2.01
100	100.000022	99.9999	0.0001	0.00016	2.00
200	200.000141	200.0000	0.0001	0.00027	2.00

The result expanded uncertainty of measurement U is stated as the standard uncertainty of measurement multiplied by the coverage factor k , which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with UKAS M3003.

Certificate No. : 22-011768

Sample Code : 22-04498-005

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REPORT OF CALIBRATION

Result of Calibration

4. Eccentric or off-centre loading

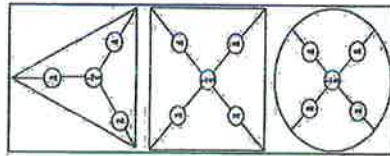
Deviation of the measurement value through off - center (eccentric) loading. The corner load increases with the weight of the load and its removal from the center of the pan support.

☒ Circle
☐ Triangular
☐ Rectangular

Weighing pan Test weight : 100

Unit : g

Range	Reading of indicator	Reading of Indicator
220		
1	99.9999	-
2	100.0000	-
3	99.9999	-
4	99.9997	-
5	100.0000	-
6	99.9999	-
Maximum difference	0.0002	-



Condition of Calibration

1. Calibration Method : WI-CL-004 base on UKAS LAB 14: 2C19
2. This result of calibration was found accurate as shown on data and place of calibration only.
3. Condition of Calibration item: Normal
4. This certification is traceable to the International System of Unit maintained at :-
- Through the reference standard laboratory of Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (Instrument number 1).
5. Reference standard Instrument :

Ambient conditions	Min	Max
Temperature (°C)	24.9	26.7
Relative Humidity (%Rh)	40.3	55.6
Air pressure (hPa)	1009.3	1010.7

Instrument

1) STANDARD WEIGHT 1 mg to 1 kg

Class ID No.
E2 LB-WE-57

Certificate No.

21-055461

Due Date

29 June 2022

- End of Report -

AUTOCLAVE

Model : FLS-1000

Serial No. : 55169083



CERTIFICATE OF CALIBRATION

Page 1 of 2
Certificate No. : 22-102070
Sample Code : 22-37024-003

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11, Sukhapiban 8 Rd., Nongkham,

Siracha, Chonburi 20230

Location of Calibration : EASTERN THAI CONSULTING 1992 CO., LTD.

(Autoclave Room)

Equipment : Autoclave

Manufacturer : TOMY

Model : FLS-1000

Serial No. : 55169083

ID No. : LABE 43/2

Date of Receipt : 19 September 2022

Date of Calibration : 19 September 2022

Condition of Calibration

1. Environment
- 1.1 Ambient temperature : Maximum 30.3 °C ; Minimum 28.8 °C
- 1.2 Relative humidity : Maximum 56.1 % ; Minimum 45.1 %
- 1.3 Line voltage supplied : Maximum 227.3 VAC ; Minimum 219.2 VAC

2. Calibration method

The calibration use in-house method: WI-CL-025 based on BS 2646 part 5: 1993 item 3.1.

3. Reference standard instrument

Instrument	Model	ID No.	Certificate No.	Due Date
3.1 Temperature Data Logger	HiTemp 140	LB-TEM-17	22-089923	31 August 2023
3.2 Temperature Data Logger	HiTemp 140	LB-TEM-16	22-023585	08 March 2023
3.3 Temperature Data Logger	TEMP 1000S	LB-TEM-14	22-089922	31 August 2023

4. This certificate is traceable to the international system of unit (SI Unit).

The measurement is traceable to Asia Medical and Agricultural Laboratory and Research Center Public Company Limited.

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

6. Condition of calibration item : Normal

Calibrated by

Mr. Sarawoot Thammo

Approved by

(Mr. Somchai Neampunt)

Scientist

Signed for Director

Issue date

22 September 2022

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

The calibration result is applied only to the above calibrated item and was found accurate as shown on date and place of calibration only.

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 unit 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 Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC)

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REPORT OF CALIBRATION

Page 2 of 2
Certificate No. : 22-102070
Sample Code : 22-37024-01

Results of Calibration

Resolution : 1 °C

1. Reporting of Temperature

Calibration point (°C)	UUC* setting (°C)	UUC* reading		Measured Temperature at each positions (°C)			Uncertainty ± (°C)	Coverage factor k
		Temperature (°C)	Pressure (MPa)	# 1	# 2 Ref	# 3		
121	121	121	0.11	121.81	121.80	121.83	0.64	2.00

2. Characterization results

Calibration Point (°C)	Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
121	0.08	0.12	0.17

Notes

- UUC* = Unit Under Calibration
- The quoted uncertainty includes "Stability of chamber and loading effect in chamber at 20% of uniformity".
- 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.
- Stability - one-half of the greatest maximum difference of measured temperatures at any one sensor.
- Overall variation - the difference of the maximum and the minimum measured temperatures throughout observation time.
- UUC* reading - the average reading of indicating device that forms the integral part of the autoclave.
- Calibration results without adjustment.

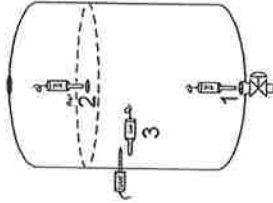


Figure: Example of sensor installation Positions

- Standard 1 = In the chamber drain, within 100 mm.
Standard 2 = In the upper half of the chamber.
Standard 3 = Attached to the load temperature probe, within 20 mm.

The result expanded uncertainty of measurement U is stated as the standard uncertainty of measurement multiplied by the coverage factor k , which for a normal distribution correspond to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with UKAS M3003.

- End of Report -

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TEL 02-516-2422

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361 Soi Ladprao 122, Ladprao Road,

Phlabphla, Wang Thonglang, Bangkok 10310

CONTACT@AMARC.CO.TH

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BOD INCUBATOR

ID No. : LABE 19/1

NSC-TS1-TS17025
CALIBRATION 0352

Page 1 of 3

CERTIFICATE OF CALIBRATION

Certificate No. : 22-011764

Sample Code : 22-04498-001

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11, Sukhapiban 8 Rd., Nongkham,

Siracha, Chonburi 20230

Location of Calibration : EASTERN THAI CONSULTING 1992 CO., LTD.

(Laboratory)

Equipment : Temperature controlled enclosures (Incubator)

Manufacturer : N/A Model : E8T1.0306

Serial No. : N/A ID No. : LABE 19/1

Date of Receipt : 03 February 2022 Date of Calibration : 03 February 2022

Condition of Calibration

1. Environment
- 1.1 Ambient temperature : Maximum 30.5 °C ; Minimum 29.5 °C
- 1.2 Relative humidity : Maximum 50.8 % ; Minimum 48.4 %
- 1.3 Line voltage supplied : Maximum 224.3 VAC ; Minimum 222.5 VAC

2. Calibration method

TLAS-G-20: Guidelines for calibration and checks of temperature controlled enclosures.

3. Reference standard instrument

Instrument	ID No.	Certificate No.	Due Date
Data Acquisition With Sensor (RTD-P100)	LB-DA-11 (RTD-138 to RTD-146)	21-035792	18 May 2022

4. This certificate is traceable to the international system of unit (SI Unit).

The measurement is traceable to Asia Medical and Agricultural Laboratory and Research Center Public Company Limited.

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

6. Condition of calibration item : Normal

Calibrated by : Mr. Pattarakorn Panklong

Scientist

Approved by

(Mr. Somchai Neampunt)

Issue date

Signed for Director

11 February 2022

The uncertainties are for a confidence probability of approximately 95%.
The calibration result is applied only to the above calibrated item and was found accurate as shown on date and place of calibration only.

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 unit of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full with the prior written approval of the Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC).

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Effective Date: 15/01/21

NSC-TS1-TS17025
CALIBRATION 0352

Page 2 of 3

REPORT OF CALIBRATION

Certificate No. : 22-011764

Sample Code : 22-04498-001

Results of Calibration

Resolution : 0.1 °C

1. Reporting of Temperature

Calibration point (°C)	UUC* setting (°C)	UUC* reading (°C)	Measured temperature at each positions (°C)								Uncertainty ± (°C)	Coverage factor <i>k</i>	
			# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8			# 9 ^{ref}
20	20.0	20.0	20.61	20.09	19.46	19.73	20.22	20.37	20.12	20.19	20.28	0.29	2.00

2. Characterization results

Calibration point (°C)	Stability ± (°C)	Uniformity (°C)	Overall variation (°C)
20	0.09	0.88	1.28

Notes

* UUC* = Unit Under Calibration

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Effective Date: 15/01/21

NSC-TIS-1517025
CALIBRATION 0152

Page 3 of 3

Certificate No. : 22-011764

Sample Code : 22-04498-001

REPORT OF CALIBRATION

Results of Calibration

Notes

1. Sensor installation locations
 - 1.1 All sensors at any corners or wells should be positioned 5 cm (a x b x c) from the wall.
 - 1.2 The reference sensor is preferably located of the geometric center of the chamber.
2. Interior dimensions approx of chamber :
W = 70 cm ; D = 60 cm ; H = 124 cm
3. Air valve or fresh air level : Off
4. Fan level : Open
5. The quoted uncertainty includes* Stability of chamber and loading effect in chamber at 20% of uniformity *.
6. 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.
7. Stability - one-half of the greatest maximum difference of measured temperatures at any one sensor.
8. Overall variation - the difference of the maximum and the minimum measured temperatures throughout observation time.
9. UUC* reading - the average reading of indicating device that forms the integral part of the enclosure.
10. Calibration results without adjustment.

The result expanded uncertainty of measurement U is stated as the standard uncertainty of measurement multiplied by the coverage factor k , which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with UKAS M 3003.

- End of Report -

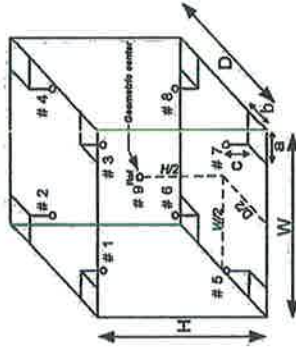


Figure: Example of sensor

Installation Positions

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BOD INCUBATOR

ID No. : LABE 19/2

Rev. 09



REPORT OF CALIBRATION

Page 3 of 3

Certificate No. : 22-007487

Sample Code : 22-02578-006

Results of Calibration

Notes

1. Sensor installation locations
 - 1.1 All sensors at any corners or walls should be positioned 5 cm (a x b x c) from the wall.
 - 1.2 The reference sensor is preferably located of the geometric center of the chamber.
2. Interior dimensions approx of chamber :
W = 60 cm ; D = 70 cm ; H = 124 cm
3. Air valve or fresh air level : Off
4. Fan level : Open
5. The quoted uncertainty includes "Stability of chamber and loading effect in chamber at 20% of uniformity".
6. 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.
7. Stability - one-half of the greatest maximum difference of measured temperatures at any one sensor.
8. Overall variation - the difference of the maximum and the minimum measured temperatures throughout observation time.
9. "UUC" reading - the average reading of indicating device that forms the integral part of the enclosure.
10. Calibration results without adjustment.



Figure: Example of sensor
Installation Positions

The result expanded uncertainty of measurement U is stated as the standard uncertainty of measurement multiplied by the coverage factor k , which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with UKAS M3103.

- End of Report -

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DO

Model : YSI 5000

Serial No. : 18E101961



Harikul Science Co., Ltd.
694 Soi Ratchadaniwet 24, Pracharabamphen,
Samsenok, Huai Khwang, Bangkok 10310
Tel: 0-2274-2456 Fax: 0-2274-2443
Email: info@harikul.com www.harikul.com

CERT. No.: HS-T055H

Certificate of Calibration

Calibration Date : 23 Aug 22
Submitted by : Eastern Thai Consulting 1992 Company Limited
683 Moo.11 Sukaphibai Rd., Nongkham, Sriracha,
Chonburi 20230

Model : YSI 5000
S/N : 18E101961
Probe : YSI 5010
S/N : 18A100724
ID NO. :
Air Temp ref : S/N. E00522
Barometric ref : S/N. E00522
Water Temp ref : S/N. 11431

Avg Room Temp : 20 °C
Avg Water Temp : 20 °C
Air Pressure : 760.00 mmHg
Salinity : 0 ppt

Technician : Kitipong M.

Calibration Details

Calibration Point	100% air sat. (@20 °C, DO = 9.09 mg/l)	(status)	(status)
Measurement 1 (mg/l)	9.08	(PASS)	•
Measurement 2 (mg/l)	9.08	(PASS)	•
Measurement 3 (mg/l)	9.09	(PASS)	•
Measurement 4 (mg/l)	9.10	(PASS)	•
Measurement 5 (mg/l)	9.10	(PASS)	•
Measurement 6 (mg/l)	9.09	(PASS)	•
Measurement 7 (mg/l)	9.09	(PASS)	•
Measurement 8 (mg/l)	9.08	(PASS)	•
Measurement 9 (mg/l)	9.09	(PASS)	•
Measurement 10 (mg/l)	9.08	(PASS)	•

Mean Measurement	9.09	mg/l	•
Inaccuracy	0.00	mg/l	•
Overall Status	(PASS)		

Manufacturer Specification

Accuracy = +/- 0.02 mg/l

- 1) This certificate is issued based on the result that are found as shown on date and place of test only.
- 2) The calibration procedure followed in accordance with Harikul Science Co., Ltd.
- 3) This result shall not be used for advertising purpose.

Technician Signature

Laboratory Manager

Hot Air Oven

Model : UM 400

Serial No. : 900982



CERTIFICATE OF CALIBRATION

Page 1 of 3

Certificate No. : 22-025399
Sample Code : 22-09604-002

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11, Sukhaphiban 8 Rd., Nongkham,

Sriacha, Chonburi 20230

Location of Calibration : EASTERN THAI CONSULTING 1992 CO., LTD.

(Hot Lab)

Equipment : Temperature controlled enclosures (Hot air oven)

Manufacturer : Memmert Model : UM 400

Serial No. : 900982 ID No. : LABE 17/1

Date of Receipt : 11 March 2022 Date of Calibration : 11 March 2022

Condition of Calibration

1. Environment	1.1 Ambient temperature	: Maximum 28.7 °C	: Minimum 27.4 °C
	1.2 Relative humidity	: Maximum 61.5 %	: Minimum 55.8 %
	1.3 Line voltage supplied	: Maximum 226.5 VAC	: Minimum 224.7 VAC

2. Calibration method

TLAS-G-20: Guidelines for calibration and checks of temperature controlled enclosures.

3. Reference standard instrument

Instrument	ID No.	Certificate No.	Due Date
Data Acquisition With Sensor (RTD-P100)	LB-DA-11 (RTD-138 to RTD-146)	21-035792	18 May 2022

4. This certificate is traceable to the international system of unit (SI Unit).

The measurement is traceable to Asia Medical and Agricultural Laboratory and Research Center Public Company Limited.

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

6. Condition of calibration item : Normal

Calibrated by

Mr. Natthanan Phosri

Approved by

(Mr. Somchai Neampunt)

Issue date

14 March 2022

Signed for Director

The uncertainties are for a confidence probability of approximately 95%.
The calibration result is applied only to the above calibrated item and was found accurate as shown on date and place of calibration only.

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 unit 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 Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC).

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Effective Date: 15/10/21



REPORT OF CALIBRATION

Page 2 of 3

Certificate No. : 22-025399
Sample Code : 22-09604-002

Results of Calibration

Resolution : 0.1 °C

1. Reporting of Temperature

Calibration point (°C)	UUC* setting (°C)	UUC* reading (°C)	Measured temperature at each positions (°C)								Uncertainty ± (°C)	Coverage factor k	
			# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8			# 9 nd
85	85.0	85.0	85.05	84.99	84.66	84.71	84.85	84.92	84.96	84.86	84.98	0.25	2.00

2. Characterization results

Calibration point (°C)	Stability ± (°C)	Uniformity (°C)	Overall variation (°C)
85	0.08	0.35	0.54

Notes

- UUC* = Unit Under Calibration

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Effective Date: 15/10/21

NSC-TSI-TS17025
CALIBRATION0152

Page 3 of 3

REPORT OF CALIBRATION

Certificate No. : 22-025399

Sample Code : 22-09604-002

Results of Calibration

Notes

1. Sensor installation locations

1.1 All sensors at any corners or walls should be positioned

5 cm (a x b x c) from the wall.

1.2 The reference sensor is preferably located of the geometric center of the chamber.

2. Interior dimensions approx of chamber :

W = 40 cm ; D = 28 cm ; H = 39 cm

3. Air valve or fresh air level : Off

4. Fan level : Open

5. The quoted uncertainty includes "Stability of chamber and loading effect in chamber at 20% of uniformity".

6. 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.

7. Stability - one-half of the greatest maximum difference of measured temperatures at any one sensor.

8. Overall variation - the difference of the maximum and the minimum measured temperatures throughout observation time.

9. UUC* reading - the average reading of indicating device that forms the integral part of the enclosure.

10. Calibration results without adjustment.

The result expanded uncertainty of measurement U is stated as the standard uncertainty of measurement multiplied by the coverage factor k , which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with UKAS MD003.

- End of Report -

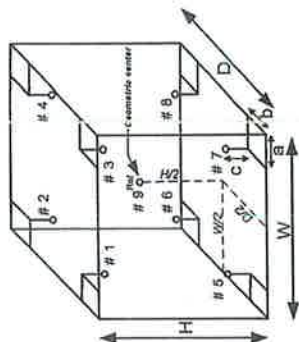


Figure: Example of sensor
Installation Positions

COPY

LIQUID IN GLASS THERMOMETER

Model : Total immersion

Serial No. : 43560



Calibration Certificate

Certificate No.: 2300368-001-01
Client name: EASTERN THAI CONSULTTONG 1992 CO., LTD.
Address: 683 Moo 11, Sukhapibarn 8 Rd.,
 Nongkharn, Sriracha, Chonburi 20230

Page 1 of 3

Equipment: Liquid-in-Glass Thermometer

Manufacturer: Precision

Model / Type: Total Immersion

Serial No.: 43560

ID No.: LABE 16/1

Order No.: 2300368

Operation No.: 2300368-001

Date of Receipt: 7 November 2022

Date of Calibration: 15 November 2022

Calibrated by Mr. Nuttapol Niyomchat
 Specialist

Date of Issue: 18 November 2022

(Mr. Pheraphat Tuanjit)

Manager, 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: 01 Date: 20-04-65



Calibration Report

Certificate No.: 2300368-001-01
Equipment: Liquid-in-Glass Thermometer Type: Total Immersion
 Range: -1.9 to 101.1 °C Resolution: 0.1 °C
 ID No.: LABE 16/1 Serial No.: 43560
 Manufacturer: Precision
Date of Calibration: 15 November 2022

Page 2 of 3

Location: Temperature Calibration Laboratory, National Food Institute

Environment Condition: Ambient Temperature 23 °C ± 3 °C

Relative Humidity 55 % ± 15 %

Condition of this results of Calibration:

1. Calibration Method :
 - In-house method : W-TE-015 based on ASTM E77-07
 - 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
BLACK STACK THERMOMETER	1560/2560	A39258/A39719	PSL-T 0674/65	7-Jun-23	TISTR
Platinum Resistance Thermometer (PRT)	5615	808926			

Support Equipment : - Ice point Unit, ID No.: noa. 614/21

- Low Temperature Bath (Deep Well Compact Bath), Model: 7381, S/N: B53496.
- Low Temperature Bath (Deep Well Compact Bath), Model: 7341, S/N: A5A084.
- High Temperature Bath (Deep Well Compact Bath), Model: 6331, S/N: A5A087.

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

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pH Meter

Model : SevenCompactTM pH/Ion Meter S220

Serial No. : B448305208

Certificate Number CCP-1416-22

Certificate Number CCP-1416-22

Calibration Certificate SevenCompact™ pH/Ion Meter S220

Customer

Company EASTERN THAI CONSULTING 1992 CO., LTD.
Address 863 Moo 11, Sukhaphan 8 Rd., Nong Khun
Srinacha
Chonburi 20230
Customer ID number 301608441
Customer representative Sasiporn Nakh

Assignment ID



Instrument

Type SevenCompact™ S220 Instrument Serial Number B449303208
Internal Identification LABE 11/4 Firmware version 1.20.06

Technical specifications

Measuring Range -1999.9 ... 1999.9 mV
Resolution 0.1 mV
Limit of Error ± 0.2 mV

Temperature range ATC -30.0 ... 130.0 °C
Temperature range ATC -5.0 ... 130.0 °C
Resolution 0.1 °C
Limit of Error ± 0.1 °C

Procedure Statement

METTLER TOLEDO Calibration SOP (Doc. No. ME-300275718) will be used as referring documentation to adjust and certify the instrument indicated in the "Type" and "Serial number" section. The measurement results of this certification were obtained at ambient conditions.

Certification Tools

Certified digital voltmeter
Manufacturer GOSSEN METRAWATT
Control No. ANA77

Serial number ZD1740
Certificate number E11213186
Due date August 8, 2022

Certified Temperature Resistors

Manufacturer METTLER TOLEDO / ME-S1302410
Control No. ANA137

Serial number A424
Certificate number 31344
Due date August 25, 2023

Designation	Nominal value	Certified value
NTC 30 kΩ, 0 °C	94.980 kΩ	94.9556 kΩ
NTC 30 kΩ, 25 °C	30.000 kΩ	30.0137 kΩ
NTC 30 kΩ, 50 °C	10.999 kΩ	10.9649 kΩ
NTC 30 kΩ, 75 °C	4.528 kΩ	4.5257 kΩ
NTC 30 kΩ, 100 °C	2.070 kΩ	2.06949 kΩ
PT 1000, 0 °C	1.000 kΩ	1.000166 kΩ
PT 1000, 25 °C	1.0974 kΩ	1.097464 kΩ
PT 1000, 50 °C	1.1940 kΩ	1.194202 kΩ
PT 1000, 75 °C	1.2899 kΩ	1.290136 kΩ
PT 1000, 100 °C	1.3861 kΩ	1.385061 kΩ

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Certificate Number CCP-1416-22

Certification Measurements

Designation	Certified value	Measured value	Max. Tolerance	Passed / Failed
pH/mV Sensor Input				
-1500 mV	-1500.0 mV	-1500.0 mV	0.2 mV	Passed
-1000 mV	-1000.0 mV	-999.9 mV	0.2 mV	Passed
-500 mV	-500.0 mV	-499.9 mV	0.2 mV	Passed
-180 mV	-180.0 mV	-180.0 mV	0.2 mV	Passed
0 mV	0.0 mV	0.1 mV	0.2 mV	Passed
180 mV	180.0 mV	180.0 mV	0.2 mV	Passed
500 mV	500.0 mV	499.9 mV	0.2 mV	Passed
1000 mV	1000.0 mV	999.9 mV	0.2 mV	Passed
1500 mV	1500.0 mV	1499.9 mV	0.2 mV	Passed

pH/mV Sensor Input
at High Impedance

Designation	Measured low Imp.	Measured high Imp.	Max. Tolerance	Passed / Failed
1800 mV	1800.0 mV	1800.0 mV	0.6 mV	Passed

Temperature Sensor Input

Designation	Nominal value	Measured value	Max. Tolerance	Passed / Failed
NTC 30 K Ω 0 $^{\circ}$ C	0.0 $^{\circ}$ C	0.0 $^{\circ}$ C	0.1 $^{\circ}$ C	Passed
NTC 30 K Ω 25 $^{\circ}$ C	25.0 $^{\circ}$ C	25.0 $^{\circ}$ C	0.1 $^{\circ}$ C	Passed
NTC 30 K Ω 50 $^{\circ}$ C	50.0 $^{\circ}$ C	50.0 $^{\circ}$ C	0.1 $^{\circ}$ C	Passed
NTC 30 K Ω 75 $^{\circ}$ C	75.0 $^{\circ}$ C	74.9 $^{\circ}$ C	0.1 $^{\circ}$ C	Passed
NTC 30 K Ω 100 $^{\circ}$ C	100.0 $^{\circ}$ C	99.9 $^{\circ}$ C	0.1 $^{\circ}$ C	Passed
PT1000, 0 $^{\circ}$ C	0.0 $^{\circ}$ C	0.1 $^{\circ}$ C	0.1 $^{\circ}$ C	Passed
PT1000, 25 $^{\circ}$ C	25.0 $^{\circ}$ C	25.0 $^{\circ}$ C	0.1 $^{\circ}$ C	Passed
PT1000, 50 $^{\circ}$ C	50.0 $^{\circ}$ C	50.0 $^{\circ}$ C	0.1 $^{\circ}$ C	Passed
PT1000, 75 $^{\circ}$ C	75.0 $^{\circ}$ C	75.1 $^{\circ}$ C	0.1 $^{\circ}$ C	Passed
PT1000, 100 $^{\circ}$ C	100.0 $^{\circ}$ C	100.1 $^{\circ}$ C	0.1 $^{\circ}$ C	Passed

Digital sensor input with
pH Sensor

Sensor recognition	The sensor was recognized correctly by the meter	Passed
--------------------	--	--------

Summary of Certification

Certification of instrument

Passed

The instrument referred to in this certificate has fulfilled the criteria of the certification. This is indicated by the notation Passed in the columns above.

Remarks

Certification of the instrument was performed by

Name	Function	Service Engineer
Palpat Saeapapuwat		
Place		
Laboratory room		
Calibration Date:	February 7, 2022	Signature
		ELECTRONIC SIGNATURE

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Performance Test

Control No. CCE-1416-22/1

Company: EASTERN THAI CONSULTING 1992 CO., LTD.
Address: 683 Moo 11, Sukhaphiban 8 Rd., Nong KhanSitrachua

Chonburi 20230 Assignment ID *0332342430*

pH Electrode

Type: Inlab Expert Pro-ISM S/N: 1976465

Certified standards used

Standard 1: Type: pH Buffer Manufacturer: METTLER TOLEDO Exp. date: Dec-22
Nominal value: pH (25.00 $^{\circ}$ C): 4.01 Lot No.: 1F351C

Standard 2: Type: pH Buffer Manufacturer: METTLER TOLEDO Exp. date: Dec-22
Nominal value: pH (25.00 $^{\circ}$ C): 7.00 Lot No.: 1F351M

Standard 3: Type: pH Buffer Manufacturer: METTLER TOLEDO Exp. date: Jan-23
Nominal value: pH (25.00 $^{\circ}$ C): 9.21 Lot No.: 1G012G

Test equipment: Type: pH Meter Manufacturer: METTLER TOLEDO Cal date: 7-Feb-22
S/N: B448305208 No. of certificate: CCP-1416-22 Model: S220

Adjustment

Set Calibration Buffer					
B2: (25 $^{\circ}$ C) 7.00, 4.01, 9.21					
Select Calibration Mode					
3-Point Calibration					
Cal 1		2-Point calibration		2-Point calibration	
ATC		pH		pH	
ATC		25.0		ATC	
Cal 2		ATC		ATC	
ATC		24.6		ATC	
Offset (mV)		3.4		---	
Slope % (or mV/pH)		97.6		---	
Cal 3		ATC		24.7	
Slope % (or mV/pH)		ATC		98.2	

Measurements

Before adjustment				After adjustment			
Buffer Values		Measured		Buffer Values		Measured	
pH		pH		pH		pH	
4.01		ATC		4.01		ATC	
7.00		ATC		7.00		ATC	
9.21		ATC		9.21		ATC	
Difference		pH		Difference		pH	
-0.06		ATC		-0.02		ATC	
0.03		ATC		0.01		ATC	
-0.01		ATC		-0.01		ATC	
0.01		ATC		0.01		ATC	
0.00		ATC		0.00		ATC	

Remarks: The difference result of calibrated electrode should be within ± 0.05 pH

Place: Laboratory room Calibration Date: February 7, 2022

Service Specialist: Palpat Saeapapuwat Signature: Electronic Signature

This is an original document, copies are not valid for METTLER TOLEDO

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STANDARD WEIGHT 50 g



Certificate No. : 22-052238

Sample Code : 22-19150-003

CERTIFICATE OF CALIBRATION

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11, Sukhapiban 8 Rd., Nongkham,

Sriracha, Chonburi 20230

Location of Calibration : Asia Medical and Agricultural Laboratory and Research Center Public Company Limited
(Calibration Laboratory)

Equipment : Standard Weight 50 g

Manufacturer : METTLER TOLEDO

Class : F1

Serial No. : N/A

ID No. : LABE 10/1

Date of Receipt : 18 May 2022

Date of Calibration : 30 May 2022

Calibrated by : Mr. Somwang Sangdee
Scientist

Issue date : 31 May 2022

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

The calibration result is applied only to the above calibrated item and was found accurate as shown on date and place of calibration only.

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 unit 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 Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC).

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Rev.05

CONTACT@AMARC.CO.TH

WWW.AMARC.CO.TH

Effective Date: 15/10/21



Certificate No. : 22-052238

Sample Code : 22-19150-003

REPORT OF CALIBRATION

Equipment : Standard Weight 50 g

Manufacturer : METTLER TOLEDO

Class : F1

Serial No. : N/A

ID No. : LABE 10/1

Result of Calibration :

☒ Without adjustment☐ Adjustment

Conventional value of the result of weighing in air. For a weight taken at a reference temperature (t_{ref}) of 20°C, the conventional mass is the mass of a reference weight of a density (ρ_{ref}) of 8000 kg.m⁻³ which it balances in air of a reference density (ρ_a) of 1.2 kg.m⁻³

Description	Deviation	Conventional	Expanded	Maximum	ID No.
		Mass	Uncertainty	Permissible Error	
	(mg)		(mg)	\pm (mg)	
50 g	-0.324	49.999676 g	0.10	0.30	LABE 10/1

The result expanded uncertainty of measurement U is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2.0$, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with UKAS M3003

361 Soi Ladprao 122, Ladprao Road,

Phlabphla, Wang Thonglang, Bangkok 10310

FM-CL-064

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Rev.03

CONTACT@AMARC.CO.TH

WWW.AMARC.CO.TH

Effective Date: 15/10/21



Certificate No. : 22-052238

Sample Code : 22-19150-003

REPORT OF CALIBRATION

Condition of Calibration :

1. Ambient Conditions : Temperature $20^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$, Relative humidity $50\% \pm 10\%$ and air density 1.20 kg/m^3

2. Calibration Method : Direct comparison weighing according to OIML R111-1 : 2004(E)

3. Reference standard instrument

Instrument	Class	ID No.	Certificate No.	Due Date
1) Standard Weight 1 mg to 1 kg	E2	LB-WE-79	21-079366	22 September 2022

4. This certification is traceable to the International System of Unit maintained at : -

Asia Medical and Agricultural Laboratory and Research Center Public Company Limited

(Instrument number 1).

5. Condition of Calibration item: Normal

6. Description of Calibrated Item :

Type and Nominal Value :	Standard Weight 50 g
Shape :	Cylindrical weight with knob
Material :	Stainless steel
Case :	Wooden Box
Comments :	Recalibration

- End of Report -

COPY

STANDARD WEIGHT 100 g



Certificate No. : 22-052239
Sample Code : 22-19150-004

CERTIFICATE OF CALIBRATION

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.
683 Moo 11, Sukhaphiban 8 Rd., Nongkham,
Sriracha, Chonburi 20230

Location of Calibration : Asia Medical and Agricultural Laboratory and Research Center Public Company Limited
(Calibration Laboratory)

Equipment : Standard Weight 100 g

Manufacturer : N/A

Class : N/A

Serial No. : N/A

ID No. : LABE 10/2

Date of Receipt : 18 May 2022

Date of Calibration : 30 May 2022

Calibrated by : Mr. Somwang Sangdee
Scientist

Issue date : 31 May 2022

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

The calibration result is applied only to the above calibrated item and was found accurate as shown on date and place of calibration only.

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 unit 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 Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC).



Certificate No. : 22-052239
Sample Code : 22-19150-004

REPORT OF CALIBRATION

Equipment : Standard Weight 100 g
Manufacturer : N/A
Class : N/A
Serial No. : N/A
ID No. : LABE 10/2

Result of Calibration :

☒ Without adjustment

☐ Adjustment

Conventional value of the result of weighing in air. For a weight taken at a reference temperature (t_{ref}) of 20°C, the conventional mass is the mass of a reference weight of a density (ρ_{ref}) of 8000 kg.m⁻³ which it balances in air of a reference density (ρ_a) of 1.2 kg.m⁻³

Description	Deviation	Conventional	Expanded	Maximum	ID No.
		Mass	Uncertainty	Permissible Error	
	(mg)		(mg)	\pm (mg)	
100 g	-0.171	99.999829 g	0.16	0.50	LABE 10/2

The result expanded uncertainty of measurement U is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2.0$, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with UKAS M3003

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Certificate No. : 22-052239

Sample Code : 22-19150-004

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REPORT OF CALIBRATION

Condition of Calibration

1. Ambient Conditions : Temperature $20^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$, Relative humidity $50\% \pm 10\%$ and air density 1.18 kg/m^3
2. Calibration Method : WI-CL-007 base on OIML R 111-1 : 2004(E)

3. Reference standard instrument

Instrument	Class	ID No.	Certificate No.	Due Date
1) Standard Weight 1 mg to 1 kg	E2	LB-WE-79	21-079366	22 September 2022

4. This certification is traceable to the International System of Unit maintained at : -

Asia Medical and Agricultural Laboratory and Research Center Public Company Limited

(Instrument number 1).

5. Condition of Calibration item: Normal

6. Description of Calibrated Item :

Type and Nominal Value :	Standard Weight 100 g
Shape :	Cylindrical weight with knob
Material :	Stainless steel
Case :	Wooden Box
Comments :	Recalibration

* End of Report *

COPY

STANDARD WEIGHT 50 g



Certificate No. : 22-052237
Sample Code : 22-19150-002

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CERTIFICATE OF CALIBRATION

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.
683 Moo 11, Sukhapiban 8 Rd., Nongkham,
Sriracha, Chonburi 20230

Location of Calibration : Asia Medical and Agricultural Laboratory and Research Center Public Company Limited
(Calibration Laboratory)

Equipment : Standard Weight 50 g

Manufacturer : N/A

Class : N/A

Serial No. : N/A

ID No. : LABE 10/4

Date of Receipt : 18 May 2022

Date of Calibration : 30 May 2022

Calibrated by Mr. Somwang Sangdee Approved by (Mr. Somchai Neampunt)
Scientist
Signed for Director

Issue date 31 May 2022

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

The calibration result is applied only to the above calibrated item and was found accurate as shown on date and place of calibration only.

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 unit 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 Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC).



Certificate No. : 22-052237

Sample Code : 22-19150-002

REPORT OF CALIBRATION

Equipment : Standard Weight 50 g

Manufacturer : N/A

Class : N/A

Serial No. : N/A

ID No. : LABE 10/4

Result of Calibration :

☒ Without adjustment☐ Adjustment

Conventional value of the result of weighing in air. For a weight taken at a reference temperature (t_{ref}) of 20°C, the conventional mass is the mass of a reference weight of a density (ρ_{ref}) of 8000 kg.m⁻³ which it balances in air of a reference density (ρ_0) of 1.2 kg.m⁻³

Description	Deviation (mg)	Conventional Mass	Expanded Uncertainty (mg)	Maximum Permissible Error \pm (mg)	ID No.
50 g	-0.111	49.999889 g	0.10	0.30	LABE 10/4

The result expanded uncertainty of measurement U is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2.0$, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with UKAS M3003

COPY



Certificate No. : 22-052237

Sample Code : 22-19150-002

REPORT OF CALIBRATION

Condition of Calibration

1. Ambient Conditions : Temperature 20 °C ± 1.5°C, Relative humidity 50% ± 10% and air density 1.18 kg/m³
2. Calibration Method : WI-CL-007 base on OIML R 111-1 : 2004(E)

3. Reference standard instrument

Instrument	Class	ID.No.	Certificate No.	Due Date
1) Standard Weight 1 mg to 1 kg	E2	LB-WE-79	21-079366	22 September 2022

4. This certification is traceable to the International System of Unit maintained at : -

Asia Medical and Agricultural Laboratory and Research Center Public Company Limited

(Instrument number 1).

5. Condition of Calibration item: Normal

6. Description of Calibrated item :

Type and Nominal Value :	Standard Weight 50 g
Shape :	Cylindrical weight with knob
Material :	Stainless steel
Case :	Wooden Box
Comments :	Recalibration

- End of Report -

COPY