

เอกสารแนบ 6

เอกสารสอบเทียบเครื่องมือที่ใช้ในการวิเคราะห์



CALIBRATION LABORATORY CO., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com Email: sale@cal-laboratory.com

CLC
Accredited
ISO/IEC 17025



CALIBRATION LABORATORY CO., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com Email: sale@cal-laboratory.com

CLC
Accredited
ISO/IEC 17025



REPORT OF CALIBRATION

FOR

NOMENCLATURE : DO METER
MANUFACTURER : HANNA INSTRUMENTS
MODEL / TYPE : HI5421/HH76483
SERIAL NO. : 04240005101/KC1A11T8H
DATE OF CALIBRATION : 26 April 2023

ENVIRONMENT CONDITIONS :

Temperature : $(25 \pm 2.5) ^\circ\text{C}$ Relative Humidity : $(50 \pm 15) \% \text{RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. CLC-CPCH-06. The calibration was performed by direct measurement with Certified Reference Material (CRM).

REFERENCE STANDARD USED :

Dissolved Oxygen, Sigma-Aldrich Product ID QC3077-500ML.

TRACEABILITY :

The measurements are traceable to International System of Units (SI), through Merck Co., Ltd.
Lot LRAD0713.01, Due Date September 2023.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2.00$ which for a normal distribution corresponds to a coverage probability of approximately 95 %. It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q23044469

F3-011-04/01-12

page 2 of 3



@ckcalibration



CALIBRATION LABORATORY CO., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com Email: sale@cal-laboratory.com

CLC
Accredited
ISO/IEC 17025



CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : DO METER
MANUFACTURER : HANNA INSTRUMENTS
MODEL / TYPE : HI5421/HH76483
SERIAL NO. : 04240005101/KC1A11T8H
CLID. NO. : 272101220
JOB CONTROL NO. : 230425044469

CUSTOMER :

OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTHAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 25 April 2023

DATE OF ISSUED : 28 April 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Sukgasem Sechanart

Calibration Engineer

Approved By :

Authorized Signatory

28 April 2023

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23044469

F3-011-04/01-12

page 1 of 3



@ckcalibration



CALIBRATION LABORATORY Co., LTD.
2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com Email: sale@cal-laboratory.com



CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : pH METER
MANUFACTURER : HANNA INSTRUMENTS
MODEL / TYPE : HI5521/HI1131
SERIAL NO. : 04160019101/061334CN
CLID. NO. : 272101219
JOB CONTROL NO. : 230425044468

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTHAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 25 April 2023 DATE OF ISSUED : 28 April 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By : Sukgasem Sechanart
Calibration Engineer



Approved By :
Authorized Signatory

28 April 2023

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23044468
F3-011-04/01-12

page 1 of 3



@clccalibration



CALIBRATION LABORATORY Co., LTD.
2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com Email: sale@cal-laboratory.com



CONDITION OF CALIBRATION ITEM : GOOD
MEASUREMENT RESULTS : (X) without adjustment () adjustment

The table in the following gives the calibration results and associated measurement uncertainties of Do Meter.

CALIBRATION DATA

Nominal Value (mg/L)	DUC Reading (mg/L)	Correction (mg/L)	Uncertainty (mg/L)
5.91	5.92	-0.01	± 0.22

Note. The Scope of Accredited ANAB Certificate No. ACDM-2814 Version 008 Page 4 of 54

This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23044469
F3-011-04/01-12

page 3 of 3



@clccalibration

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The table in the following gives the calibration results and associated measurement uncertainties of pH meter.

CALIBRATION DATA

pH METER RESULT @ 25 °C

Standard pH Buffer Solution (pH)	pH Meter Reading (pH)	pH Meter Reading (mV)	Correction (pH)	Uncertainty of pH Measurement (\pm pH)	k Factor
4.000	3.98	132.0	+0.020	0.014	2.20
6.996	7.00	-41.1	-0.004	0.015	2.06
10.007	10.01	192.5	-0.003	0.100	2.05

Technical Note. Setting function CAL 3 point (4,7,10).

The Scope of Accredited TISI Certificate No. 23-LB0092 Issue 01 Page 91 of 138

This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23044468
F3-011-04/01-12

page 3 of 3



@clcalibration

REPORT OF CALIBRATION

FOR

NOMENCLATURE : pH METER
MANUFACTURER : HANNA INSTRUMENTS
MODEL / TYPE : HI5521/HI1131
SERIAL NO. : 04160019101/061334CN
DATE OF CALIBRATION : 26 April 2023.

ENVIRONMENT CONDITIONS :

Temperature : $(25 \pm 2.5) ^\circ\text{C}$ Relative Humidity : $(50 \pm 15) \% \text{ RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-128. The calibration was performed by direct measurement with Certified Reference Material (CRM).

REFERENCE STANDARD USED :

1. pH Standard Solution, NIMT TRM CODE TRM-S-2003, TRM CODE TRM-S-2007.
2. pH Standard Solution, Control Company Catalog Number 06-664-260, 11754256, Lot Number CC728484.

TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through National Institute of Metrology (Thailand). Lot Number. 160221, 180121. Due Date 05 May 2023.
2. The measurements are traceable to International System of Units (SI), through Control Company. Certificate No. 4281-12405788, Due Date 30 June 2023.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor complies with the table which for a normal distribution corresponds to a coverage probability of approximately 95 %. It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02:2022)"

Certificate No. Q23044468
F3-011-04/01-12

page 2 of 3



@clcalibration

REPORT OF CALIBRATION

FOR

NOMENCLATURE : DIGITAL THERMOMETER
MANUFACTURER : HANNA INSTRUMENTS
MODEL / TYPE : HI5521/Hi7662-W
SERIAL NO. : 04160019101/0615024N
DATE OF CALIBRATION : 27 April 2023

ENVIRONMENT CONDITIONS :

Temperature : $(23 \pm 2) ^\circ\text{C}$ Relative Humidity : $(55 \pm 10) \% \text{ RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-187 based on ASTM E 644-11-2019 as calibration guidelines.

The calibration was performed by using Calibration Bath, Precision Thermometer and IPRT which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

1. Calibration Bath, Kamtec Model OB-22/2 ULT S/N. 17115653.
2. Precision Thermometer, ASL Model F200-A-8 S/N. 014433/03.
3. IPRT, ASL Model TI00-250-1D S/N. L0193A-1-1.

TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q22130792, Due Date 05 January 2024.
2. The measurements are traceable to International System of Units (SI), through Thailand Institute of Scientific and Technological Research (TISTR) Certificate No. PSL-T 0010/66, Due Date 06 November 2023.
3. The measurements are traceable to International System of Units (SI), through National Institute of Metrology (Thailand). Certificate No. TT-0166-22, Due Date 01 December 2023.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2.00$ which for a normal distribution corresponds to a coverage probability of approximately 95 %. It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q23044467

F3-011-04/01-12

page 2 of 3



@clccalibration

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : DIGITAL THERMOMETER
MANUFACTURER : HANNA INSTRUMENTS
MODEL / TYPE : HI5521/Hi7662-W
SERIAL NO. : 04160019101/0615024N
CLID. NO. : 232202088
JOB CONTROL NO. : 230425044467

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
6735-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTHAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 25 April 2023

DATE OF ISSUED : 02 May 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By : Monthira Treechum
Calibration Engineer



Approved By :

Authorized Signatory

02 May 2023

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23044467

F3-011-04/01-12

page 1 of 3



@clccalibration



CALIBRATION LABORATORY CO., LTD.

2/10-11/4, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.ccl-laboratory.com Email: sale@ccl-laboratory.com



NSC-TISI-TIS 17025
CALIBRATION 089
CLC

Accredited
ISO/IEC 17025
CLC

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The DUC Reading were recorded and the means value were reported of five times measurement in the table below.

CALIBRATION DATA

CORRECTION OF TEMPERATURE [THERMISTOR]

Immersion depth (mm)	Actual Temperature (°C)	DUC Reading (°C)	Correction (°C)	Uncertainty ± (°C)
105	24.00	24.1	-0.10	0.07
	25.01	25.1	-0.09	
	27.00	27.1	-0.10	

Note: Probe Ø 3.5 mm

Materials : Metal Sheath.

The Scope of Accredited TISI Certificate No. 23-LE0092 Issue 01 Page 35 of 138

This report is valid for the above stated instrument/s only.

Certificate No. Q23044467

F3-011-04/01-12

End of Certificate



@cclcalibration



700/20-21 Phaholyothin Rd., Samsennai, Phayathai,
Bangkok 10400 Thailand

Tel : +66 (02) 615 4899

Fax : +66 (02) 615 4644

E-mail : cal@giic.co.th



CERTIFICATE No.: CAL00706-23 PAGE: 1 OF: 3

Certificate of Calibration

Equipment : DIGITAL THERMO-HYGROMETER
Manufacturer : DIGICON
Model / Type : TH-03
Serial No. : 115092766
ID No. :
Customer : OKLA TESTING & CONSULTING SERVICE CO., LTD.

67/35-38, 3rd Floor, Pheikasem 7/1, Watthapra,
Bangkokyai, Bangkok 10600 Thailand.

C.S.R. No. : H0000744-23

Received Date : 01 June 2023

Calibration Date : 08 June 2023 - 09 June 2023

Calibrated By : MR. TONTRAKARN SRIKACHA

Approved By : MR. TONTRAKARN SRIKACHA

Issue Date : 09 June 2023

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

This certificate may not be reproduced except in full unless permission for the reproduction has been obtained in writing from the laboratory.

CALIBRATION REPORT

The temperature scale used was based on ITS-90.

All data shown below were as-received values without adjustment.

Calibration result :

Function : Temperature Measurement.

Standard Temperature (°C)	¹ UUC Reading (°C)	Error (°C)	Uncertainty of Measurement (± °C)
10.011	10	-0.011	0.83
24.985	25	0.015	0.91
40.004	40	-0.004	1.0

Function : Humidity Measurement : (25.05 °C)

Standard Humidity (% rh)	¹ UUC Reading (% rh)	Error (% rh)	Uncertainty of Measurement (± % rh)
24.96	21	-3.96	1.8
49.98	42	-7.98	1.8
84.95	80	-4.95	2.9

¹UUC = Unit Under Calibration

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

- END -

CALIBRATION REPORT

Condition of this calibration result :

1. Environment :
 Temperature : (25 ± 3) °C
 Relative Humidity : (50 ± 15) % RH

2. Reference / procedure Used :

- This equipment was calibrated by comparison to precision humidity measuring instrument into humidity chamber for humidity measurement and a platinum resistance thermometer into temperature chamber for temperature measurement according to GILC Calibration Laboratory
- Calibration Procedure No. GILCLAB-CP-H01, GILCLAB-CP-H03.

3. Reference Standard Instrument :

Instrument	Model	Serial No	Certificate No	Due Dated
Platinum Resistance Thermometer	PCR-1	RB-31604	TMU222445	8 Jul 23
Data Logger	HC2-S	60936993	22T10535	19 Oct 23
Dual Measurement Multimeter	GDM 8261A	GEF925925	CAL00324-23	11 Mar 24

4. This Certification is traceable to the SI unit through :

- NA Caltechnologies Co., Ltd.

- Quality Calibration

- GILC Calibration Laboratory

5. Uncertainty :

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

6. Disclaimer :

- The laboratory accepted that was we has done in our calibration method. It with no guarantee that it works as you believe that it should and user accept the risks that occur. We accept no liability for any damage or financial losses.



CALIBRATION LABORATORY CO., LTD.

210-11,14,55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax. 02-578-2672 www.cal-laboratory.com Email: sale@cal-laboratory.com



Accredited
ISO/IEC 17025

REPORT OF CALIBRATION

FOR

NOMENCLATURE : ELECTRONIC BALANCE
MANUFACTURER : SARTORIUS
MODEL / TYPE : BSA224S-CW
SERIAL NO. : 35790699
LOCATION SITE : LABORATORY
DATE OF CALIBRATION : 02 June 2023

ENVIRONMENT CONDITIONS :

Temperature : 27°C to 28 °C

Relative Humidity : 54 % to 56 %

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-46 according to EURAMET cg-18 Version 4.0 (11/2015).
The calibration was performed by Comparison with Weight Set which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

Weight Set, Mettler Toledo Class E2 S/N. 158850.

TRACEABILITY :

The measurements are traceable to International System of Units (SI), through National Institute of Metrology (Thailand).
Certificate No. MM-01/20-21, Due Date 17 December 2023.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor complies with the table which for a normal distribution corresponds to a coverage probability of approximately 95%. It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q23053313

F3-011-04/01-12

page 2 of 3



@clcalibration



CALIBRATION LABORATORY CO., LTD.

210-11,14,55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax. 02-578-2672 www.cal-laboratory.com Email: sale@cal-laboratory.com



Accredited
ISO/IEC 17025

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : ELECTRONIC BALANCE
MANUFACTURER : SARTORIUS
MODEL / TYPE : BSA224S-CW
SERIAL NO. : 35790699
CLID. NO. : 362101186
JOB CONTROL NO. : 230518053313

CUSTOMER :

OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTHAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 18 May 2023

DATE OF ISSUED : 08 June 2023

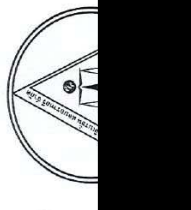
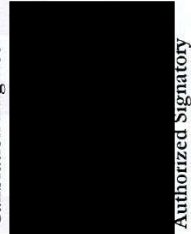
Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Chonvit Thongnat
Calibration Engineer

Approved By :

Authorized Signatory
08 June 2023



This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23053313

F3-011-04/01-12

page 1 of 3



@clcalibration

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : REFRIGERATOR [FREEZER]
MANUFACTURER : SHIMAX
MODEL / TYPE : MAC3D
SERIAL NO. : N/A[011/190118]
CLID. NO. : 332200066
JOB CONTROL NO. : 230518053320

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTHAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 18 May 2023

DATE OF ISSUED : 06 June 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Wenick Inchaisri
Calibration Engineer

Approved By :

Authorized Signatory

06 June 2023

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23053320

F3-011-04/01-12

page 1 of 4



@clcalibration

CONDITION OF CALIBRATION ITEM : GOOD
MEASUREMENT RESULTS : (X) without adjustment () adjustment

CALIBRATION DATA

1. Error of indications

Nominal Test Value (g)	Conventional mass (g)	Display Value (g)	Error of Balance (g)	Uncertainty \pm (mg)	Coverage factor k
Unload	0.0000	0.0000	0.0000	0.06	2.00
20.0000	20.0000	19.9999	-0.0001	0.09	2.00
40.0000	40.0000	40.0000	0.0000	0.12	2.00
60.0000	59.9999	60.0000	+0.0001	0.14	2.00
80.0000	79.9999	80.0000	+0.0001	0.18	2.00
100.0000	100.0000	100.0000	0.0000	0.15	2.00
120.0000	120.0000	120.0000	0.0000	0.29	2.00
140.0000	140.0000	139.9999	-0.0001	0.29	2.00
160.0000	159.9999	160.0000	+0.0001	0.29	2.00
180.0000	179.9999	179.9999	0.0000	0.30	2.00
200.0000	199.9997	199.9997	0.0000	0.29	2.00
220.0000	219.9997	219.9998	+0.0001	0.49	2.00

2. Repeatability of indications

Nominal Test Value (g)	Standard Deviation of Reading (g)
200.0000	0.00000

3. Effect of eccentric application of a load on the indication

<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div><div><div></div></div></div>	<div><div></div></div>
<div><div><div></div></div><div><div></div></div></div>	<div><div><div></div></div></div>	

Note. The Scope of Accredited TISI Certificate No. 23-LB0092 Issue 02 Page 116 of 138

This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23053313

F3-011-04/01-12

page 3 of 3



@clcalibration

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The table in the following gives the calibration results and associated measurement uncertainties of the measuring refrigerator [freezer].

CALIBRATION DATA

1. REFRIGERATOR [FREEZER] PERFORMANCE

Setting (°C)	DUC		Measured Uniformity (°C)	Measured Stability (°C)	Measured Overall Variation (°C)
	Indicating (°C)				
2.0	2.0		1.11	0.16	1.69
4.0	4.0		1.18	0.23	1.74
6.0	6.0		1.25	0.14	1.56

Certificate No. Q23053320

F3-011-04/01-12

page 3 of 4



@clcalibration

REPORT OF CALIBRATION

FOR

NOMENCLATURE : REFRIGERATOR [FREEZER]
MANUFACTURER : SHIMAX
MODEL / TYPE : MAC3D
SERIAL NO. : N/A[011/190118]
LOCATION SITE : OKLA 67
DATE OF CALIBRATION : 02 June 2023

ENVIRONMENT CONDITIONS :

Temperature : 29 °C to 30 °C

Relative Humidity : 52 % to 54 %

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-165 according to TLAS G-20-1/02-08 as calibration guidelines.

The calibration was performed by using Hydra Data Logger which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

Hydra Data Logger, Fluke Model 2620 S/N: 5592550.

TRACEABILITY :

The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd.

Certificate No. Q22066550, Due Date 07 July 2023.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor complies with the table which for a normal distribution corresponds to a coverage probability of approximately 95 %.

It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q23053320

F3-011-04/01-12

page 2 of 4



@clcalibration

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : HOT AIR OVEN
MANUFACTURER : KWF
MODEL / TYPE : SOV70B
SERIAL NO. : KWF2021021902[OKLA-LAB-013/170621]
CLID. NO. : 332101755
JOB CONTROL NO. : 230518053317

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTIAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 18 May 2023 DATE OF ISSUED : 06 June 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Wenick Inchaisri

Calibration Engineer

Approved By :

Authorized Signatory

06 June 2023

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23053317

F3-011-04/01-12

page 1 of 4



@clcalibration

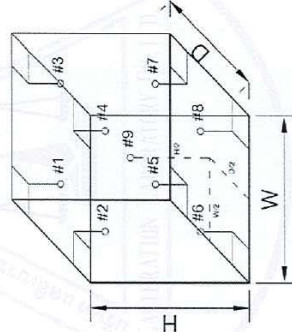
CALIBRATION DATA

2. TEMPERATURE DISTRIBUTION

DUC	Setting (°C)	Indicating (°C)	Measured Temperature (°C) @ Probe No. 9 is Ref.									Uncertainty ± (°C)	Coverage factor k
			1	2	3	4	5	6	7	8	9		
2.0	2.0	2.0	3.03	2.43	1.86	1.58	2.76	2.64	1.83	2.94	2.01	0.52	2.00
4.0	4.0	4.0	4.61	4.04	3.50	3.25	4.26	4.01	3.38	4.09	3.53	0.57	2.00
6.0	6.0	6.0	6.20	5.61	5.10	4.88	5.88	5.57	4.97	5.58	5.05	0.53	2.00

Technical Note : W = 50 cm, D = 38 cm, H = 125 cm.

The Scope of Accredited TISI Certificate No. 23-LB0092 Issue 02 Page 129 of 138



This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23053320

F3-011-04/01-12

page 4 of 4



@clcalibration



CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The table in the following gives the calibration results and associated measurement uncertainties of the measuring hot air oven.

CALIBRATION DATA

1. HOT AIR OVEN PERFORMANCE

Setting (°C)	DUC		Measured Uniformity (°C)	Measured Stability (°C)	Measured Overall Variation (°C)
	Indicating (°C)				
104.0	104.0	1.77	0.31		2.12
140.0	140.0	2.83	0.54		3.35
160.0	160.0	3.53	0.49		4.30
180.0	180.0	4.31	0.80		5.70



REPORT OF CALIBRATION

FOR

NOMENCLATURE : HOT AIR OVEN
MANUFACTURER : KWF
MODEL / TYPE : SOV70B
SERIAL NO. : KWF2021021902[OKLA-LAB-013/170621]
LOCATION SITE : LABORATORY
DATE OF CALIBRATION : 02 June 2023

ENVIRONMENT CONDITIONS :

Temperature : 29 °C to 30 °C Relative Humidity : 52 % to 54 %

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-165 according to TLAS G-20-102-08 as calibration guidelines.
The calibration was performed by using Hydra Data Bucket which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

Hydra Data Bucket, Fluke Model 2635A S/N. 6496317.

TRACEABILITY :

The measurements are traceable to International System of Units (SI) , through Calibration Laboratory Co., Ltd.
Certificate No. Q22098934, Due Date 29 September 2023.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor complies with the table which for a normal distribution corresponds to a coverage probability of approximately 95 %.
It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"





CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : INCUBATOR
MANUFACTURER : S-COOL
MODEL / TYPE : SM 61 M
SERIAL NO. : 18021147/012/190118]
CLID. NO. : 332101758
JOB CONTROL NO. : 230518053316
CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTHAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 18 May 2023

DATE OF ISSUED : 06 June 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Wenick Inchaistri

Calibration Engineer

Approved By :

Authorized Signatory

06 June 2023

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23053316

F3-011-04/01-12

page 1 of 4



@clcalibration



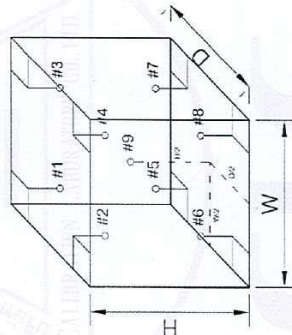
CALIBRATION DATA

2. TEMPERATURE DISTRIBUTION

DUC		Measured Temperature (°C) @Probe No.9 is Ref.									Uncertainty ± (°C)	Coverage factor k
Setting (°C)	Indicating (°C)	1	2	3	4	5	6	7	8	9		
104.0	104.0	106.36	105.72	106.73	105.53	105.62	105.38	105.19	105.54	106.79	1.15	2.00
140.0	140.0	142.72	141.68	143.28	141.44	141.34	140.66	140.82	141.13	143.12	1.36	2.00
160.0	160.0	162.70	161.52	163.53	161.43	161.04	159.97	160.54	160.68	163.08	1.50	2.00
180.0	180.0	183.26	181.95	184.40	182.07	181.27	179.71	180.88	180.76	183.54	1.70	2.00

Technical Note : W = 40 cm, D = 35 cm, H = 50 cm.

The Scope of Accredited TISI Certificate No. 23-LB0092 Issue 02 Page 129 of 138



This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23053317

F3-011-04/01-12

page 4 of 4



@clcalibration



CALIBRATION LABORATORY CO., LTD.

2/10-11,14,55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2872 www.cal-laboratory.com Email:sale@cal-laboratory.com



NSC-TISI-TIS 17025
CALIBRATION 0059
CLC

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The table in the following gives the calibration results and associated measurement uncertainties of the measuring incubator.

CALIBRATION DATA

1. INCUBATOR PERFORMANCE

DUC		Measured Uniformity (°C)	Measured Stability (°C)	Measured Overall Variation (°C)
Setting (°C)	Indicating (°C)			
20.0	20.0	0.61	0.09	1.18

Certificate No. Q23053316

F3-011-04/01-12

page 3 of 4



@clcalibration



CALIBRATION LABORATORY CO., LTD.

2/10-11,14,55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2872 www.cal-laboratory.com Email:sale@cal-laboratory.com



NSC-TISI-TIS 17025
CALIBRATION 0059
CLC

REPORT OF CALIBRATION

FOR

NOMENCLATURE : INCUBATOR
MANUFACTURER : S-COOL
MODEL / TYPE : SM 61 M
SERIAL NO. : 18021147/012/1901181
LOCATION SITE : LABORATORY
DATE OF CALIBRATION : 02 June 2023

ENVIRONMENT CONDITIONS :

Temperature : 29 °C to 30 °C

Relative Humidity : 52 % to 54 %

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-165 according to TLAS G-20-1/02-08 as calibration guidelines.

The calibration was performed by using Hydra Data Logger which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

Hydra Data Logger, Fluke Model 2620 S/N: 5592550.

TRACEABILITY :

The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd.

Certificate No. Q22066550, Due Date 07 July 2023.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor complies with the table which for a normal distribution corresponds to a coverage probability of approximately 95 %.

It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q23053316

F3-011-04/01-12

page 2 of 4



@clcalibration



CALIBRATION LABORATORY Co., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cali-laboratory.com E-mail: sale@cali-laboratory.com



CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : WATER BATH
MANUFACTURER : LABTECH
MODEL / TYPE : LWB-222A
SERIAL NO. : BCCLJ23001C[OKI/A-LAB-008/122011]
CLID. NO. : 332103272
JOB CONTROL NO. : 230518053319
CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
6735-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTHAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 18 May 2023

DATE OF ISSUED : 06 June 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Wenick Inchaistri

Calibration Engineer



Approved By :

Authorized Signatory

06 June 2023

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23053319

F3-011-04/01-12

page 1 of 4



@clcalibration



CALIBRATION LABORATORY Co., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cali-laboratory.com E-mail: sale@cali-laboratory.com

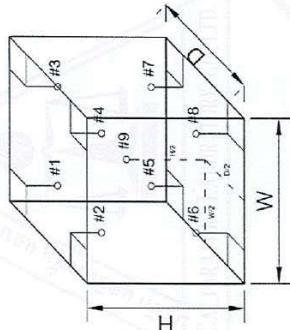


CALIBRATION DATA

2. TEMPERATURE DISTRIBUTION

DUC:	Measured Temperature (°C)@Probe No.9 is Ref.									Uncertainty ± (°C)	Coverage factor <i>k</i>		
	Setting (°C)	Indicating (°C)	1	2	3	4	5	6	7			8	9
20.0	20.0	20.0	20.04	19.81	19.41	19.12	20.11	19.58	19.65	19.44	19.59	0.45	2.00

The Scope of Accredited TISI Certificate No. 23-LB0092 Issue 02 Page 129 of 138



This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23053316

F3-011-04/01-12

page 4 of 4



@clcalibration

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The table in the following gives the calibration results and associated measurement uncertainties of the measuring water bath.

CALIBRATION DATA

1. WATER BATH PERFORMANCE

Test Point (°C)	DUC Reading (°C)	Uniformity (°C)	Stability (°C)
60	-	0.5	0.3



REPORT OF CALIBRATION

FOR

NOMENCLATURE : WATER BATH
MANUFACTURER : LABTECH
MODEL / TYPE : LWB-222A
SERIAL NO. : BCCLJ23001CJOKLA-LAB-008/122011
LOCATION SITE : OKLA TESTING
DATE OF CALIBRATION : 02 June 2023

ENVIRONMENT CONDITIONS :

Temperature : 29 °C to 30 °C

Relative Humidity : 52% to 54%

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-135 based on ASTM E 715-80:2016 as calibration guidelines.

The calibration was performed by using Hydra Data Logger which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

Hydra Data Logger, Fluke Model 2620 S/N. 5592550.

TRACEABILITY :

The measurements are traceable to International System of Units (SI) , through Calibration Laboratory Co., Ltd.

Certificate No. Q23022733, Due Date 01 September 2023.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2,00$ which for a normal distribution corresponds to a coverage probability of approximately 95 % .
It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"





CALIBRATION LABORATORY Co., LTD.

2/10-11,4, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com Email:sale@cal-laboratory.com



NSC-TIS-17025
CALIBRATION 0059
CLC

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : BURETTE
MANUFACTURER : ISO LAB
MODEL / TYPE : 25 ml
SERIAL NO. : N/AIEM-MBR10002/17
CLID. NO. : 272201671
JOB CONTROL NO. : 230425044052

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTHAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 25 April 2023 DATE OF ISSUED : 02 May 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By : Sukasem Sechanart
Calibration Engineer



Approved By :
Authorized Signatory
02 May 2023

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23044052
F3-011-04/01-12



@clccalibration



CALIBRATION LABORATORY Co., LTD.

2/10-11,4, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com Email:sale@cal-laboratory.com



NSC-TIS-17025
CALIBRATION 0059
CLC

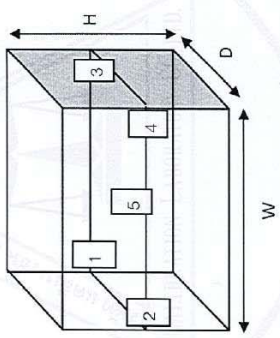
CALIBRATION DATA

2. TEMPERATURE DISTRIBUTION

Test Point (° C)	DUC Reading (° C)	STD Reading (° C)					Uncertainty ± (° C)
		Probe No. 1	Probe No. 2	Probe No. 3	Probe No. 4	Probe No. 5	
60	-	60.0	60.0	60.1	59.9	60.0	0.9

Technical Note : W = 50 cm, D = 30 cm, H = 15 cm.

The Scope of Accredited TISI Certificate No. 23-LB0092 Issue 02 Page 128 of 138



This report is valid for the above stated instrument/s only.

Certificate No. Q23053319
F3-011-04/01-12



@clccalibration



CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The calibration was performed by applied volume to the Device Under Calibration (DUC). The actual volume readings from STD were reported in average of seven times measurements.

CALIBRATION DATA

CORRECTION OF VOLUME

DUC Test point (ml)	Actual volume (ml)	Correction (ml)	Uncertainty \pm (ml)	Coverage factor k
5	5.0003	+0.0003	0.0038	2.00
15	15.0044	+0.0044	0.0066	2.00
25	25.0092	+0.0092	0.0068	2.00

Type of glassware : ☐ to Contain ☒ to Deliver

Note. The Scope of Accredited TISI Certificate No. 23-LB0092 Issue 01 Page 94 of 138

This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23044052

F3-011-04/01-12

page 3 of 3



@clcalibration



REPORT OF CALIBRATION

FOR

NOMENCLATURE : BURETTE
MANUFACTURER : ISO LAB
MODEL / TYPE : 25 ml
SERIAL NO. : N/AIEM-MBR10002/171
DATE OF CALIBRATION : 27 April 2023

ENVIRONMENT CONDITIONS :

Temperature : $(20 \pm 2.5) ^\circ\text{C}$ Relative Humidity : $(50 \pm 10) \% \text{ RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-86 according to ASTM E542-01:2021 as calibration guidelines.
The calibration was performed by using Electronic Balance, Thermo-hygrometer, Barometer and Thermometer which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

1. Barometer, Barigo S/N.001.
2. Electronic Balance, Sartorius Model CPA224S S/N.23908487.
3. Thermo-hygrometer, Isuzu Model 3-3126 S/N.30760420.
4. Thermometer, Braun S/N. 1.

TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23006081, Due Date 19 January 2024.
2. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23019117, Due Date 22 February 2024.
3. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q22130804, Due Date 04 January 2024.
4. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23010604, Due Date 02 February 2024.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty multiplied by the coverage factor complies with the table which for a normal distribution corresponds to a coverage probability of approximately 95 %.
It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q23044052

F3-011-04/01-12

page 2 of 3



@clcalibration



CALIBRATION LABORATORY CO., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



NSC-TS-17025
CALIBRATION 0059
CLC

REPORT OF CALIBRATION

FOR

NOMENCLATURE	:	CYLINDER
MANUFACTURER	:	FAVORIT
MODEL / TYPE	:	50 ml
SERIAL NO.	:	N/A [EM-VPP02501/21]
DATE OF CALIBRATION	:	31 March 2023

ENVIRONMENT CONDITIONS :

Temperature : $(20 \pm 2.5) ^\circ\text{C}$ Relative Humidity : $(50 \pm 10) \% \text{ RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-84 according to ASTM E542-01:2021 as calibration guidelines.

The calibration was performed by using Electronic Balance, Thermo-hygrometer, Barometer and Thermometer which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

1. Barometer, Barigo S/N.001.
2. Electronic Balance, Sartorius Model CPA224S S/N.23908487.
3. Thermo-hygrometer, Isuzu Model 3-3126 S/N.30760420.
4. Thermometer, Braun S/N. 1.

TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23006081, Due Date 19 January 2024.
2. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23019117, Due Date 22 February 2024.
3. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q22130804, Due Date 04 January 2024.
4. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23010604, Due Date 02 February 2024.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor complies with the table which for a normal distribution corresponds to a coverage probability of approximately 95 %.

It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4:02 M:2022)"

Certificate No. Q23034770

F3-011-04/01-12

page 2 of 3



@clcalibration



CALIBRATION LABORATORY CO., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



NSC-TS-17025
CALIBRATION 0059
CLC

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE	:	CYLINDER
MANUFACTURER	:	FAVORIT
MODEL / TYPE	:	50 ml
SERIAL NO.	:	N/A [EM-VPP02501/21]
CLID. NO.	:	272300782
JOB CONTROL NO.	:	230328034770

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTIAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 28 March 2023

DATE OF ISSUED : 04 April 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Sukgasm Sechanart
Calibration Engineer



Approved By :

Authorized Signatory
04 April 2023



This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23034770

F3-011-04/01-12

page 1 of 3



@clcalibration



CALIBRATION LABORATORY CO., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yeek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2872 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



NSC-TISI-TIS 17025
CALIBRATION 0059
CLC

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : CYLINDER
MANUFACTURER : BOROSIL
MODEL / TYPE : 500 ml
SERIAL NO. : 0334-58
CLID. NO. : 272201292
JOB CONTROL NO. : 230328034769

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHIEKASEM 7/1 RD., WATTAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 28 March 2023

DATE OF ISSUED : 04 April 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Sukgasem Sechanart
Calibration Engineer

Approved By :

Authorized Signatory

04 April 2023

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23034769

F3-011-04/01-12

page 1 of 3



@clccalibration



CALIBRATION LABORATORY CO., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yeek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2872 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



NSC-TISI-TIS 17025
CALIBRATION 0059
CLC

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The calibration was performed by applied volume to the Device Under Calibration (DUC). The actual volume readings from STD were reported in average of seven times measurements.

CALIBRATION DATA

CORRECTION OF VOLUME

DUC Test point (ml)	Actual volume (ml)	Correction (ml)	Uncertainty \pm (ml)	Coverage factor k
50	50.1999	+0.1999	0.0180	2.00

Type of glassware : ☒ to Contain ☐ to Deliver

Note. The Scope of Accredited TISI Certificate No. 23-LB0092 Issue 01 Page 94 of 138

This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23034770

F3-011-04/01-12

page 3 of 3



@clccalibration

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The calibration was performed by applied volume to the Device Under Calibration (DUC). The actual volume readings from STD were reported in average of seven times measurements.

CALIBRATION DATA

CORRECTION OF VOLUME

DUC Test point (ml)	Actual volume (ml)	Correction (ml)	Uncertainty \pm (ml)	Coverage factor <i>k</i>
500	498.75	-1.25	0.10	2.00

Type of glassware : ☒ to Contain ☐ to Deliver

Note: The Scope of Accredited TISI Certificate No. 23-LB0092 Issue 01 Page 94 of 138

This report is valid for the above stated instrument/s only.

Certificate No. Q23034769
F3-011-04/01-12

End of Certificate

page 3 of 3



@clccalibration

REPORT OF CALIBRATION

FOR

NOMENCLATURE : CYLINDER
MANUFACTURER : BOROSIL
MODEL / TYPE : 500 ml
SERIAL NO. : 0334-58
DATE OF CALIBRATION : 31 March 2023

ENVIRONMENT CONDITIONS :

Temperature : (20 ± 2.5) °C Relative Humidity : (50 ± 10) % RH

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-84 according to ASTM E542-01:2021 as calibration guidelines.
The calibration was performed by using Electronic Balance, Thermo-hygrometer, Barometer and Thermometer which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

1. Barometer, Barigo S/N:001.
2. Electronic Balance, Sartorius Model Secura6102-1s S/N:0042104938.
3. Thermo-hygrometer, Isha Model 3-3126 S/N:30760420.
4. Thermometer, Braunan S/N: 1.

TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23006081, Due Date 19 January 2024.
2. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q22121337, Due Date 01 December 2023.
3. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q22130804, Due Date 04 January 2024.
4. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23010604, Due Date 02 February 2024.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty multiplied by the coverage factor complies with the table which for a normal distribution corresponds to a coverage probability of approximately 95 % . It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (E-A-4/02 M:2022)"

Certificate No. Q23034769
F3-011-04/01-12

page 2 of 3



@clccalibration



CALIBRATION LABORATORY CO., LTD.

210-11,14,55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail:sale@cal-laboratory.com



CLC
Accredited
ISO/IEC 17025

REPORT OF CALIBRATION

FOR

NOMENCLATURE : MEASURING PIPETTE
MANUFACTURER : GLASSCO
MODEL / TYPE : 1 ml
SERIAL NO. : N/A[EM-MER01001/19]
DATE OF CALIBRATION : 29 March 2023

ENVIRONMENT CONDITIONS :

Temperature : $(20 \pm 2.5) ^\circ\text{C}$ Relative Humidity : $(50 \pm 10) \% \text{ RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-89 according to ASTM E542-01:2021 as calibration guidelines.
The calibration was performed by using Electronic Balance, Thermo-hygrometer, Barometer and Thermometer which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

1. Barometer, Barigo S/N.001.
2. Electronic Balance, Sartorius Model CPA224S S/N.23908487.
3. Thermo-hygrometer, Iseru Model 3-3126 S/N.30760420.
4. Thermometer, Brannan S/N. 1.

TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q230060381, Due Date 19 January 2024.
2. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23019117, Due Date 22 February 2024.
3. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q22130804, Due Date 04 January 2024.
4. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23010604, Due Date 02 February 2024.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor complies with the table which for a normal distribution corresponds to a coverage probability of approximately 95 %.
It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q23034780

F3-011-04/01-12

page 2 of 3



@clccalibration



CALIBRATION LABORATORY CO., LTD.

210-11,14,55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail:sale@cal-laboratory.com



CLC
Accredited
ISO/IEC 17025

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : MEASURING PIPETTE
MANUFACTURER : GLASSCO
MODEL / TYPE : 1 ml
SERIAL NO. : N/A[EM-MER01001/19]
CLID. NO. : 272201297
JOB CONTROL NO. : 230328034780

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHUETKASEM 7/1 RD., WATTAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 28 March 2023

DATE OF ISSUED : 03 April 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Sukgasem Sechanart
Calibration Engineer



Approved By :

Authorized Signatory
03 April 2023



This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23034780

F3-011-04/01-12

page 1 of 3



@clccalibration



CALIBRATION LABORATORY CO., LTD.

2/10-11/14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail:sale@cal-laboratory.com



150/15C 17025



NSC-TISI-TIS 17025
CALIBRATION 0059
CLC

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : MEASURING PIPETTE
MANUFACTURER : GLASSCO
MODEL / TYPE : 5 ml
SERIAL NO. : N/A[EM-MER01001/18]
CLID. NO. : 272201296
JOB CONTROL NO. : 230328034779

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTHAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 28 March 2023 DATE OF ISSUED : 03 April 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Sukgasem Sechanart

Calibration Engineer

Approved By :

Authorized Signatory

03 April 2023

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23034779
F3-011-04/01-12

page 1 of 3



@clccalibration



CLC
Accredited
150/15C 17025

CALIBRATION LABORATORY CO., LTD.

2/10-11/14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail:sale@cal-laboratory.com



NSC-TISI-TIS 17025
CALIBRATION 0059
CLC

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The calibration was performed by applied volume to the Device Under Calibration (DUC). The actual volume readings from STD were reported in average of seven times measurements.

CALIBRATION DATA

CORRECTION OF VOLUME

DUC Test point (ml)	Actual volume (ml)	Correction (ml)	Uncertainty \pm (ml)	Coverage factor k
*0.1	0.1015	+0.0015	0.0024	2.00
*0.5	0.5012	+0.0012	0.0025	2.00
1	1.0003	+0.0003	0.0025	2.00

Type of glassware : ☐ to Contain ☒ to Deliver

Note. * means Calibrations marked "Not TISI Accredited" in this Certificate have been included for completeness.

The Scope of Accredited TISI Certificate No. 23-LB0092 Issue 01 Page 96 of 138

This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23034780
F3-011-04/01-12

page 3 of 3



@clccalibration



CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The calibration was performed by applied volume to the Device Under Calibration (DUC) . The actual volume readings from STD were reported in average of seven times measurements.

CALIBRATION DATA

CORRECTION OF VOLUME				
DUC Test point (ml)	Actual volume (ml)	Correction (ml)	Uncertainty \pm (ml)	Coverage factor k
*0.5	0.5034	+0.0034	0.0025	2.00
2.5	2.4871	-0.0129	0.0029	2.00
5	4.9818	-0.0182	0.0029	2.00

Type of glassware : ☐ to Contain ☒ to Deliver

Note. * means Calibrations marked " Not TISI Accredited " in this Certificate have been included for completeness.

The Scope of Accredited TISI Certificate No. 23-LB0092 Issue 01 Page 96 of 138

This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23034779

F3-011-04/01-12

page 3 of 3



@clcalibration



REPORT OF CALIBRATION

FOR

NOMENCLATURE : MEASURING PIPETTE
MANUFACTURER : GLASSCO
MODEL / TYPE : 5 ml
SERIAL NO. : N/A [EM-MER01001/18]
DATE OF CALIBRATION : 29 March 2023

ENVIRONMENT CONDITIONS :

Temperature : (20 ± 2.5) °C

Relative Humidity : (50 ± 10) % RH

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-89 according to ASTM E542-01:2021 as calibration guidelines.

The calibration was performed by using Electronic Balance, Thermo-hygrometer, Barometer and Thermometer which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

1. Barometer, Barigo S/N.001.
2. Electronic Balance, Sartorius Model CPA224S S/N.23908487.
3. Thermo-hygrometer, Isuzu Model 3-3126 S/N.30760420.
4. Thermometer, Brannan S/N. 1.

TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23006081, Due Date 19 January 2024.
2. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23019117, Due Date 22 February 2024.
3. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q22130804, Due Date 04 January 2024.
4. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23010604, Due Date 02 February 2024.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor complies with the table which for a normal distribution corresponds to a coverage probability of approximately 95 %.

It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q23034779

F3-011-04/01-12

page 2 of 3



@clcalibration



CALIBRATION LABORATORY Co., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



NSC-TIS-TIS 17025
CALIBRATION 0059
CLC



CALIBRATION LABORATORY Co., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



NSC-TIS-TIS 17025
CALIBRATION 0059
CLC

REPORT OF CALIBRATION

FOR

NOMENCLATURE : MEASURING PIPETTE
MANUFACTURER : GLASSCO
MODEL / TYPE : 10 ml
SERIAL NO. : N/A|EM-MER01001/17|
DATE OF CALIBRATION : 29 March 2023

ENVIRONMENT CONDITIONS :

Temperature : $(20 \pm 2.5) ^\circ\text{C}$ Relative Humidity : $(50 \pm 10) \% \text{ RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-89 according to ASTM E542-01:2021 as calibration guidelines.

The calibration was performed by using Electronic Balance, Thermo-hygrometer, Barometer and Thermometer which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

1. Barometer, Barigo S/N.001.
2. Electronic Balance, Sartorius Model CPA224S S/N.23908487.
3. Thermo-hygrometer, Iauzu Model 3-3126 S/N.30760420.
4. Thermometer, Brannan S/N. 1.

TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23006081, Due Date 19 January 2024.
2. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23019117, Due Date 22 February 2024.
3. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q22130804, Due Date 04 January 2024.
4. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23010604, Due Date 02 February 2024.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor which corresponds to a coverage probability of approximately 95 %.

It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q23034778

F3-011-04/01-12

page 2 of 3



edccalibration

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : MEASURING PIPETTE
MANUFACTURER : GLASSCO
MODEL / TYPE : 10 ml
SERIAL NO. : N/A|EM-MER01001/17|
CLID. NO. : 272000237
JOB CONTROL NO. : 230328034778

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 28 March 2023

DATE OF ISSUED : 03 April 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Sukgasm Sechanart
Calibration Engineer

Approved By :

Authorized Signatory
03 April 2023

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23034778

F3-011-04/01-12

page 1 of 3



edccalibration



CALIBRATION LABORATORY CO., LTD.
2110-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



CALIBRATION LABORATORY CO., LTD.
NSC-TIS-17025
CALIBRATION 0059
CLC

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : VOLUMETRIC PIPETTE
MANUFACTURER : GLASSCO
MODEL / TYPE : 20 ml
SERIAL NO. : N/AIEM-YPP20201/17
CLID. NO. : 272101208
JOB CONTROL NO. : 230328034775

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTIAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 28 March 2023

DATE OF ISSUED : 03 April 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Sukgascm Sechanart
Calibration Engineer



Approved By :

Authorized Signatory

03 April 2023

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23034775

F3-011-04/01-12

page 1 of 3



@cccalibration



CALIBRATION LABORATORY CO., LTD.
2110-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



CALIBRATION LABORATORY CO., LTD.
NSC-TIS-17025
CALIBRATION 0059
CLC

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The calibration was performed by applied volume to the Device Under Calibration (DUC). The actual volume readings from STD were reported in average of seven times measurements.

CALIBRATION DATA

CORRECTION OF VOLUME

DUC Test point (ml)	Actual volume (ml)	Correction (ml)	Uncertainty \pm (ml)	Coverage factor k
1	1.0058	+0.0058	0.0025	2.00
5	4.9937	-0.0063	0.0029	2.00
10	9.9802	-0.0198	0.0039	2.00

Type of glassware : ☐ to Contain ☒ to Deliver

Note: The Scope of Accredited TIS1 Certificate No. 23-LB0092 Issue 01 Page 96 of 138

This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23034778

F3-011-04/01-12

page 3 of 3



@cccalibration

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The calibration was performed by applied volume to the Device Under Calibration (DUC). The actual volume readings from STD were reported in average of seven times measurements.

CALIBRATION DATA

CORRECTION OF VOLUME

DUC Test point (ml)	Actual volume (ml)	Correction (ml)	Uncertainty \pm (ml)	Coverage factor <i>k</i>
20	20.0020	+0.0020	0.0072	2.00

Type of glassware : ☐ To Contain ☒ To Deliver

Note. The Scope of Accredited TISI Certificate No. 23-LB0092 Issue 01 Page 96 of 138

This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23034775

F3-011-04/01-12

page 3 of 3



@clcalibration

REPORT OF CALIBRATION FOR

NOMENCLATURE : VOLUMETRIC PIPETTE
MANUFACTURER : GLASSCO
MODEL / TYPE : 20 ml
SERIAL NO. : N/AJEM-VPP20201/17
DATE OF CALIBRATION : 29 March 2023

ENVIRONMENT CONDITIONS :

Temperature : $(20 \pm 2.5) ^\circ\text{C}$ Relative Humidity : $(50 \pm 10) \% \text{ RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-89 according to ASTM E542-01:2021 as calibration guidelines.

The calibration was performed by using Electronic Balance, Thermo-hygrometer, Barometer and Thermometer which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

1. Barometer, Barigo S/N.001.
2. Electronic Balance, Sartorius Model CPA224S S/N.23908487.
3. Thermo-hygrometer, Isuzu Model 3-3126 S/N.30760420.
4. Thermometer, Brannan S/N. 1.

TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23006081, Due Date 19 January 2024.
2. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23019117, Due Date 22 February 2024.
3. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q22130804, Due Date 04 January 2024.
4. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23010604, Due Date 02 February 2024.

UNCERTAINTY :

The reported expanded uncertainty of measurement 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 %.

It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q23034775

F3-011-04/01-12

page 2 of 3



@clcalibration



CALIBRATION LABORATORY CO., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yeak 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



NSC-TS-TIS 17025
CALIBRATION 0059
CLC

REPORT OF CALIBRATION FOR

NOMENCLATURE : VOLUMETRIC PIPETTE
MANUFACTURER : HBG
MODEL / TYPE : 25 ml
SERIAL NO. : N/A|EM-VPP02501/17
DATE OF CALIBRATION : 29 March 2023

ENVIRONMENT CONDITIONS :

Temperature : $(20 \pm 2.5) ^\circ\text{C}$ Relative Humidity : $(50 \pm 10) \% \text{ RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-89 according to ASTM E542-01:2021 as calibration guidelines.

The calibration was performed by using Electronic Balance, Thermo-hygrometer, Barometer and Thermometer which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

1. Barometer, Barigo S/N.001.
2. Electronic Balance, Sartorius Model CPA224S S/N.23908487.
3. Thermo-hygrometer, Isuzu Model 3-3126 S/N.30760420.
4. Thermometer, Brannan S/N. 1.

TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q2-3006081, Due Date 19 January 2024.
2. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q2-3019117, Due Date 22 February 2024.
3. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q22130804, Due Date 04 January 2024.
4. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q2-3010604, Due Date 02 February 2024.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor complies with the table which for a normal distribution corresponds to a coverage probability of approximately 95 %.

It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q23034774

F3-011-04/01-12

page 2 of 3



@clcalibration



CALIBRATION LABORATORY CO., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yeak 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



NSC-TS-TIS 17025
CALIBRATION 0059
CLC

CERTIFICATE OF CALIBRATION FOR

NOMENCLATURE : VOLUMETRIC PIPETTE
MANUFACTURER : HBG
MODEL / TYPE : 25 ml
SERIAL NO. : N/A|EM-VPP02501/17
CLID. NO. : 272000238
JOB CONTROL NO. : 230328034774

CUSTOMER :

OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTHAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

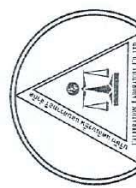
DATE OF RECEIVED : 28 March 2023

DATE OF ISSUED : 03 April 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By : Sukgasem Sechanart

Calibration Engineer



Approved By :

Authorized Signatory

03 April 2023



This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23034774

F3-011-04/01-12

page 1 of 3



@clcalibration



CALIBRATION LABORATORY CO., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



NSC-TIS-TIS 17025
CALIBRATION 0659
CLC

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : VOLUMETRIC FLASK
MANUFACTURER : SCI
MODEL / TYPE : 100 ml
SERIAL NO. : N/A|EM-VP02501/17|
CLID. NO. : 272101212
JOB CONTROL NO. : 230328034773

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTHAPRA,
BANGKOKKAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 28 March 2023 DATE OF ISSUED : 05 April 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By : Sukgasem Sechanart

Calibration Engineer



Approved By :

Authorized Signatory

05 April 2023

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23034773
F3-011-04/01-12

page 1 of 3



@ckcalibration



CALIBRATION LABORATORY CO., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



NSC-TIS-TIS 17025
CALIBRATION 0659
CLC

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The calibration was performed by applied volume to the Device Under Calibration (DUC) . The actual volume readings from STD were reported in average of seven times measurements.

CALIBRATION DATA

CORRECTION OF VOLUME

DUC Test point (ml)	Actual volume (ml)	Correction (ml)	Uncertainty \pm (ml)	Coverage factor k
25	24.9589	-0.0411	0.0076	2.00

Type of glassware : ☐ to Contain ☒ to Deliver

Note. The Scope of Accredited TISI Certificate No. 23-LB0092 Issue 01 Page 96 of 138

This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23034774
F3-011-04/01-12

page 3 of 3



@ckcalibration

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The calibration was performed by applied volume to the Device Under Calibration (DUC). The actual volume readings from STD were reported in average of seven times measurements.

CALIBRATION DATA

CORRECTION OF VOLUME

DUC Test point (ml)	Actual volume (ml)	Correction (ml)	Uncertainty \pm (ml)	Coverage factor k
100	99.9589	-0.0411	0.0190	2.00

Type of glassware : ☒ to Contain ☐ to Deliver

Note. The Scope of Accredited TISI Certificate No. 23-LB0092 Issue 01 Page 95 of 138

This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23034773

F3-011-04/01-12

page 3 of 3



@clcalibration

REPORT OF CALIBRATION

FOR

NOMENCLATURE : VOLUMETRIC FLASK
MANUFACTURER : SCI
MODEL / TYPE : 100 ml
SERIAL NO. : N/AIEM-YPP02501/17
DATE OF CALIBRATION : 03 April 2023

ENVIRONMENT CONDITIONS :

Temperature : $(20 \pm 2.5) ^\circ\text{C}$ Relative Humidity : $(50 \pm 10) \% \text{RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. W1-305-88 according to ASTM E542-01:2021 as calibration guidelines. The calibration was performed by using Electronic Balance, Thermo-hygrograph, Barometer and Thermometer which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

1. Barometer, Barigo S/N.001.
2. Electronic Balance, Sartorius Model CPA224S S/N.23908487.
3. Thermo-hygrograph, Isuzu Model 3-3126 S/N.30760420.
4. Thermometer, Brannan S/N. 1.

TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23006081, Due Date 19 January 2024.
2. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23019117, Due Date 22 February 2024.
3. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q22130804, Due Date 04 January 2024.
4. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23010604, Due Date 02 February 2024.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor complies with the table which for a normal distribution corresponds to a coverage probability of approximately 95 %.

It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q23034773

F3-011-04/01-12

page 2 of 3



@clcalibration



CALIBRATION LABORATORY CO., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



REPORT OF CALIBRATION

FOR

NOMENCLATURE : VOLUMETRIC FLASK
MANUFACTURER : BOROSIL
MODEL / TYPE : 500 ml
SERIAL NO. : N/AIEM-VPP02501/18]
DATE OF CALIBRATION : 03 April 2023

ENVIRONMENT CONDITIONS :

Temperature : $(20 \pm 2.5) ^\circ\text{C}$ Relative Humidity : $(50 \pm 10) \% \text{RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. WI-305-88 according to ASTM E542-01:2021 as calibration guidelines.
The calibration was performed by using Electronic Balance, Thermo-hygrometer, Barometer and Thermometer which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

1. Barometer, Barigo S/N 001.
2. Electronic Balance, Sartorius Model Secura6102-1s S/N:0042104938.
3. Thermo-hygrometer, Iuzu Model 3-3126 S/N:30760420.
4. Thermometer, Brannan S/N 1.

TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23006081, Due Date 19 January 2024.
2. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q22121337, Due Date 01 December 2023.
3. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q22130804, Due Date 04 January 2024.
4. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q23010604, Due Date 02 February 2024.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor complies with the table which for a normal distribution corresponds to a coverage probability of approximately 95 %. It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q23034772

F3-011-04/01-12



CALIBRATION LABORATORY CO., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : VOLUMETRIC FLASK
MANUFACTURER : BOROSIL
MODEL / TYPE : 500 ml
SERIAL NO. : N/AIEM-VPP02501/18]
CLID. NO. : 272201295
JOB CONTROL NO. : 230328034772

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD., WATTHAPRA,
BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 28 March 2023

DATE OF ISSUED : 06 April 2023

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Sukgasem Sechanart

Calibration Engineer

Approved By :

Authorized Signatory

06 April 2023

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q23034772

F3-011-04/01-12





Accredited
ISO/IEC 17025

CALIBRATION LABORATORY CO., LTD.

2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd, Ladphrae, Bangkok 10230
Tel: 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com Email: sale@cal-laboratory.com



NSC-TIS-TIS 17025
CALIBRATION 0059
CLC

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The calibration was performed by applied volume to the Device Under Calibration (DUC) . The actual volume readings from STD were reported in average of seven times measurements.

CALIBRATION DATA

CORRECTION OF VOLUME

DUC Test point (ml)	Actual volume (ml)	Correction (ml)	Uncertainty \pm (ml)	Coverage factor k
500	500.04	+0.04	0.09	2.00

Type of glassware : ☒ to Contain ☐ to Deliver

Note. The Scope of Accredited TIS Certificate No. 23-LB0092 Issue 01 Page 95 of 138

This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q23034772

F3-011-04/01-12

page 3 of 3



@clccalibration