ภาคผนวกที่ 3
ใบรายงานผลการตรวจวัดคุณภาพสิ่งแวดล้อม

ภาคผนวกที่ 3-1
ใบรายงานผลการตรวจวัดคุณภาพน้ำทิ้ง

PACIFIC LABORATORY CO., LTD.

Pacific Laboratory Co., Ltd.
14/5358 Moo 14 Tambol Bang Bua Thong
Amphoe Bang Bua Thong, Nonthaburi 11110
Tel. : 0-2045-2446-7 Fax. : 0-2045-3991

ANALYSIS REPORT

Analysis No. : Lab-W 255/2568
Job No. : PCL 0596-01/68
Report Date : April 29, 2025

Customer Name : โครงการบ้านสิริสุขุมวิท ซอย 10
Address : เลขที่ 16 ซอย สุขุมวิท 10 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Sampling Point : ส่วนแยกกากตะกอน (อาคาร A)
GPS. Coordinate : UTM 47 P 0668317 E, 1519209 N
Sampling Method : แบบจ้วง
Sampling Type : Waste Water
Sampling By : Mr. Surasak Saosung
Analyzed By : Pacific Laboratory Co., Ltd./ United Analyst and Engineering Consultant Co., Ltd.

Sampling Date : April 10, 2025
Received Date : April 11, 2025
Analytical Date : April 11-29, 2025
Sampling Time : 02:55 p.m.
Sample ID No. : 085/04/68

Item	Parameter	Unit	Method of Analysis[1]	Result
1.	pH (at 25 °C)	-	Electrometric Method (4500-H^+ B.)	7.7
2.	Biochemical Oxygen Demand	mg/l	5-Day BOD Test, Azide Modification Method (5210 B. & 4500-O C.)	46.0
3.	Total Suspended Solids	mg/l	Dried at 103-105 °C (2540 D.)	45.0
4.	Oil & Grease	mg/l	Liquid- Liquid, Partition-Gravimetric Method (5520 B.)	<5
5.	Total Coliform Bacteria	MPN/100ml	Multiple-Tube Fermentation Technique (SM: Part 9221 B and C)	>160,000[1/]
Sample Condition				เหลืองขุ่น มีตะกอน มีกลิ่น

Remark : [1] Standard Methods for Examination of water and wastewater, APHA, AWWA, WEF, 24th Edition (2023)
[1/] วิเคราะห์โดย บริษัท ยูไนเต็ด แอนนาลิสต์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด

PACIFIC LABORATORY CO., LTD. PCL

(Mr. Rnus Fakto)
Lab. Supervisor

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14/5358 Moo 14 Tambol Bang Bua Thong
Amphoe Bang Bua Thong, Nonthaburi 11110
Tel. : 0-2045-2446-7 Fax. : 0-2045-3991

ANALYSIS REPORT

Analysis No. : Lab-W 255/2568
Job No. : PCL 0596-01/68
Report Date : April 29, 2025

Customer Name : โครงการบ้านสิริสุขุมวิท ซอย 10
Address : เลขที่ 16 ซอย สุขุมวิท 10 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Sampling Point : ส่วนแยกกากตะกอน (อาคาร B)
GPS. Coordinate : UTM 47 P 0668323 E, 1519160 N
Sampling Method : แบบจ้วง
Sampling Type : Waste Water
Sampling By : Mr. Surasak Saosung
Analyzed By : Pacific Laboratory Co., Ltd./ United Analyst and Engineering Consultant Co., Ltd.

Sampling Date : April 10, 2025
Received Date : April 11, 2025
Analytical Date : April 11-29, 2025
Sampling Time : 03:10 p.m.
Sample ID No. : 086/04/68

Item	Parameter	Unit	Method of Analysis[1]	Result
1.	pH (at 25 °C)	-	Electrometric Method (4500-H^+ B.)	7.8
2.	Biochemical Oxygen Demand	mg/l	5-Day BOD Test, Azide Modification Method (5210 B. & 4500-O C.)	32.0
3.	Total Suspended Solids	mg/l	Dried at 103-105 °C (2540 D.)	105
4.	Oil & Grease	mg/l	Liquid- Liquid, Partition-Gravimetric Method (5520 B.)	<5
5.	Total Coliform Bacteria	MPN/100ml	Multiple-Tube Fermentation Technique (SM: Part 9221 B and C)	>160,000 1/
Sample Condition				เหลืองขุ่น มีตะกอน

Remark : [1] Standard Methods for Examination of water and wastewater, APHA, AWWA, WEF, 24th Edition (2023)
1/ วิเคราะห์โดย บริษัท ยูไนเต็ด แอนนาลิสต์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด

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Amphoe Bang Bua Thong, Nonthaburi 11110
Tel. : 0-2045-2446-7 Fax. : 0-2045-3991

ANALYSIS REPORT

Analysis No. : Lab-W 255/2568
Job No. : PCL 0596-01/68
Report Date : April 29, 2025

Customer Name : โครงการบ้านสิริสุขุมวิท ซอย 10
Address : เลขที่ 16 ซอย สุขุมวิท 10 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Sampling Point : บ่อพักน้ำ (อาคาร A)
GPS. Coordinate : UTM 47 P 0668300 E, 1519208 N
Sampling Method : แบบจ้วง
Sampling Type : Waste Water
Sampling By : Mr. Surasak Saosung
Analyzed By : Pacific Laboratory Co., Ltd./ United Analyst and Engineering Consultant Co., Ltd.

Sampling Date : April 10, 2025
Received Date : April 11, 2025
Analytical Date : April 11-29, 2025
Sampling Time : 02:48 p.m.
Sample ID No. : 087/04/68

Item	Parameter	Unit	Method of Analysis[1]	Result	Standard 1/	Evaluation 1/
1.	pH (at 25 °C)	-	Electrometric Method (4500-H^+ B.)	7.6	5.5-9.0	pass
2.	Biochemical Oxygen Demand	mg/l	5-Day BOD Test, Azide Modification Method (5210 B. & 4500-O C.)	30.0	≤40	pass
3.	Total Suspended Solids	mg/l	Dried at 103-105 °C (2540 D.)	39.7	≤50	pass
4.	Oil & Grease	mg/l	Liquid- Liquid, Partition-Gravimetric Method (5520 B.)	<5	≤20	pass
5.	Total Coliform Bacteria	MPN/100ml	Multiple-Tube Fermentation Technique (SM: Part 9221 B and C)	>160,000 2/	-	-
Sample Condition				เหลืองขุ่น มีตะกอน มีกลิ่น		

Remark :
[1] Standard Methods for Examination of water and wastewater, APHA, AWWA, WEF, 24th Edition (2023)
1/ ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่องกำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากอาคารบางประเภทและบางขนาด (ลงวันที่ 28 มิถุนายน พ.ศ. 2567) (อาคารประเภท ค)
2/ วิเคราะห์โดย บริษัท ยูไนเต็ด แอนนาลิสต์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด

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(Mr. Rnus Fakto)
Lab. Supervisor

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Amphoe Bang Bua Thong, Nonthaburi 11110
Tel. : 0-2045-2446-7 Fax. : 0-2045-3991

ANALYSIS REPORT

Analysis No. : Lab-W 255/2568
Job No. : PCL 0596-01/68
Report Date : April 29, 2025

Customer Name : โครงการบ้านสิริสุขุมวิท ซอย 10
Address : เลขที่ 16 ซอย สุขุมวิท 10 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Sampling Point : บ่อพักน้ำ (อาคาร B)
GPS. Coordinate : UTM 47 P 0668302 E, 1519161 N
Sampling Method : แบบจ้วง
Sampling Type : Waste Water
Sampling By : Mr. Surasak Saosung
Analyzed By : Pacific Laboratory Co., Ltd./ United Analyst and Engineering Consultant Co., Ltd.

Sampling Date : April 10, 2025
Received Date : April 11, 2025
Analytical Date : April 11-29, 2025
Sampling Time : 03:20 p.m.
Sample ID No. : 088/04/68

Item	Parameter	Unit	Method of Analysis[1]	Result	Standard 1/	Evaluation 1/
1.	pH (at 25 °C)	-	Electrometric Method (4500-H^+ B.)	7.9	5.5-9.0	pass
2.	Biochemical Oxygen Demand	mg/l	5-Day BOD Test, Azide Modification Method (5210 B. & 4500-O C.)	23.0	≤40	pass
3.	Total Suspended Solids	mg/l	Dried at 103-105 °C (2540 D.)	61.0	≤50	fail
4.	Oil & Grease	mg/l	Liquid- Liquid, Partition-Gravimetric Method (5520 B.)	<5	≤20	pass
5.	Total Coliform Bacteria	MPN/100ml	Multiple-Tube Fermentation Technique (SM: Part 9221 B and C)	>160,000 2/	-	-
Sample Condition				เหลืองใส มีตะกอน		

Remark :
[1] Standard Methods for Examination of water and wastewater, APHA, AWWA, WEF, 24th Edition (2023)
1/ ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่องกำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากอาคารบางประเภทและบางขนาด (ลงวันที่ 28 มิถุนายน พ.ศ. 2567) (อาคารประเภท ค)
2/ วิเคราะห์โดย บริษัท ยูไนเต็ด แอนนาลิสต์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด

PACIFIC LABORATORY CO., LTD. PCL

(Mr. Rnus Fakto)
Lab. Supervisor

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14/5358 Moo 14 Tambol Bang Bua Thong
Amphoe Bang Bua Thong, Nonthaburi 11110
Tel. : 0-2045-2446-7 Fax. : 0-2045-3991

ANALYSIS REPORT

Analysis No. : Lab-W 255/2568
Job No. : PCL 0596-01/68
Report Date : April 29, 2025

Customer Name : โครงการบ้านสิริสุขุมวิท ซอย 10
Address : เลขที่ 16 ซอย สุขุมวิท 10 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Sampling Point : บ่อพักน้ำก่อนปล่อยออกรางระบายสาธารณะ
GPS. Coordinate : UTM 47 P 0668347 E, 1519160 N
Sampling Method : แบบจ้วง
Sampling Type : Waste Water
Sampling By : Mr. Surasak Saosung
Analyzed By : Pacific Laboratory Co., Ltd./ United Analyst and Engineering Consultant Co., Ltd.

Sampling Date : April 10, 2025
Received Date : April 11, 2025
Analytical Date : April 11-29, 2025
Sampling Time : 03:05 p.m.
Sample ID No. : 089/04/68

Item	Parameter	Unit	Method of Analysis[1]	Result	Standard 1/	Evaluation 1/
1.	pH (at 25 °C)	-	Electrometric Method (4500-H^+ B.)	7.6	5.5-9.0	pass
2.	Biochemical Oxygen Demand	mg/l	5-Day BOD Test, Azide Modification Method (5210 B. & 4500-O C.)	24.0	≤30	pass
3.	Total Suspended Solids	mg/l	Dried at 103-105 °C (2540 D.)	26.8	≤40	pass
4.	Oil & Grease	mg/l	Liquid- Liquid, Partition-Gravimetric Method (5520 B.)	<5	≤20	pass
5.	Total Coliform Bacteria	MPN/100ml	Multiple-Tube Fermentation Technique (SM: Part 9221 B and C)	>160,000 2/	-	-
Sample Condition				เหลืองขุ่น มีตะกอน		

Remark :
[1] Standard Methods for Examination of water and wastewater, APHA, AWWA, WEF, 24th Edition (2023)
1/ ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่องกำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากอาคารบางประเภทและบางขนาด (ลงวันที่ 28 มิถุนายน พ.ศ. 2567) (อาคารประเภท ข)
2/ วิเคราะห์โดย บริษัท ยูไนเต็ด แอนนาลิสต์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด

PACIFIC LABORATORY CO., LTD. PCL

(Mr. Rnus Fakto)
Lab. Supervisor

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ภาคผนวกที่ 4
เอกสารสอบเทียบเครื่องมือตรวจวัด

CAL
Calibratech Co.,Ltd.
7/106-7 Moo 2, Sukhaprachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120
Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech_cal@yahoo.com, calibratech_cal@hotmail.com

ilac-MRA
NSC-TISI-TIS17025
CALIBRATION 0030

Certificate of Calibration

Certificate No. : 67-420078-1 **Page : 1 of 2**

Submitted by : Pacific Laboratory Co., Ltd.
14/5358 Moo 14, T. Bang Bua Thong, A. Bang Bua Thong, Nonthaburi 11110 Thailand

Equipment : pH Meter with electrode
pH meter
Manufacturer : Eutech Model : pH 700
Range : N/A pH Resolution : 0.01 pH
Serial No. : 2841305 ID No. : LAB-PH-002
Electrode
Model : N/A Serial No. : 3172493

Environment : On site calibration was carried out at the Laboratory, Pacific Laboratory Co., Ltd
Ambient Temperature : (25.0 to 26.0)° C
Relative Humidity : (40 to 45) %

Date of Received : 30 July 2024

Date of Calibration : 30 July 2024

Date of Issue : 03 August 2024

Calibrated by : Permpon Chanpu

Calibration Method : In-house method CAL-M4201 direct measurement by using standard voltage calibrator and using certified reference material (CRM)

Reference Standard Instruments : This certification is traceable to the International System of Units

1. Multiproduct Calibrator

ID No.	Cert. No.	Due Date	Traceability
400005	SG-E-00307/66	23 Aug 2025	National Institute of Metrology Thailand (NIMT)

2. Standard Buffer Solution

pH	Cert. No.	Lot No.	Exp. Date	Traceability
4.008	61293328	986281	25 Apr 2026	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
6.986	61281486	986283	25 Apr 2025	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
9.997	61281073	986282	25 Apr 2025	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025

Approved by :
(Surachai Promthong)
Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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Calibratech Co.,Ltd.
7/106-7 Moo 2, Sukhaprachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120
Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech_cal@yahoo.com, calibratech_cal@hotmail.com

Certificate of Calibration

Certificate No. : 67-420078-1

Result of Calibration :

UUC Condition As-Received : Good

Function : Electrical measurement

pH meter

Performing standard curve by Multiproduct Calibrator at pH (4,7,10)

Adjustment Curve at nominal pH	Applied Voltage (mV)	Nominal Value (pH)	UUC Reading		Correction (mV)	Uncertainty (± mV)
			(pH)	(mV)		
4, 7, 10	177.4800	4	4.00	177.5	0.0	0.12
	0.0000	7	7.00	0.1	-0.1	0.086
	-177.4800	10	10.00	-177.4	-0.1	0.12

Function : pH meter with electrode

Performing a three - buffer standard curve using buffer nominal pH (4,7,10)

Adjustment Curve at nominal pH	Standard Buffer (pH)	UUC Reading (pH)	Correction (pH)	Uncertainty (± pH)
4, 7, 10	4.008	4.01	0.00	0.0097
	6.986	7.00	-0.01	0.011
	9.997	10.01	-0.01	0.014

Remark

UUC : Unit Under Calibration

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

This reported uncertainty of measurment was based on a standard uncertainty multiplied by a coverage factor k = 2 , providing a level of confidence of approximately 95%

- o0o -

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Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech_cal@yahoo.com, calibratech_cal@hotmail.com

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CALIBRATION 0030

Certificate of Calibration

Certificate No. : 67-420078-2 **Page : 1 of 2**

Submitted by : Pacific Laboratory Co., Ltd.
14/5358 Moo 14, T. Bang Bua Thong, A. Bang Bua Thong, Nonthaburi 11110 Thailand

Equipment : pH Meter with electrode
pH meter
Manufacturer : Eutech Model : pH 700
Range : N/A pH Resolution : 0.01 pH
Serial No. : 2841305 ID No. : LAB-PH-002
Electrode
Model : N/A Serial No. : 3052953

Environment : On site calibration was carried out at the Laboratory, Pacific Laboratory Co., Ltd
Ambient Temperature : (25.0 to 26.0)° C
Relative Humidity : (40 to 45) %

Date of Received : 30 July 2024

Date of Calibration : 30 July 2024

Date of Issue : 03 August 2024

Calibrated by : Permpon Chanpu

Calibration Method : In-house method CAL-M4201 direct measurement by using standard voltage calibrator and using certified reference material (CRM)

Reference Standard Instruments : This certification is traceable to the International System of Units

1. Multiproduct Calibrator

ID No.	Cert. No.	Due Date	Traceability
400005	SG-E-00307/66	23 Aug 2025	National Institute of Metrology Thailand (NIMT)

2. Standard Buffer Solution

pH	Cert. No.	Lot No.	Exp. Date	Traceability
4.008	61293328	986281	25 Apr 2026	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
6.986	61281486	986283	25 Apr 2025	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
9.997	61281073	986282	25 Apr 2025	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025

Approved by :

(Surachai Promthong)
Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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7/106-7 Moo 2, Sukhaprachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120
Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech_cal@yahoo.com, calibratech_cal@hotmail.com

Certificate of Calibration

Certificate No. : 67-420078-2

Result of Calibration :

UUC Condition As-Received : Good

Function : Electrical measurement

pH meter

Performing standard curve by Multiproduct Calibrator at pH (4,7,10)

Adjustment Curve at nominal pH	Applied Voltage (mV)	Nominal Value (pH)	UUC Reading (pH)	UUC Reading (mV)	Correction (mV)	Uncertainty (± mV)
4, 7, 10	177.4800	4	4.00	177.5	0.0	0.12
	0.0000	7	7.00	0.1	-0.1	0.086
	-177.4800	10	10.00	-177.4	-0.1	0.12

Function : pH meter with electrode

Performing a three - buffer standard curve using buffer nominal pH (4,7,10)

Adjustment Curve at nominal pH	Standard Buffer (pH)	UUC Reading (pH)	Correction (pH)	Uncertainty (± pH)
4, 7, 10	4.008	4.01	0.00	0.0097
	6.986	7.00	-0.01	0.011
	9.997	10.01	-0.01	0.014

Remark

UUC : Unit Under Calibration

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

This reported uncertainty of measurment was based on a standard uncertainty multiplied by a coverage factor k = 2 , providing a level of confidence of approximately 95%

- o0o -

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Calibratech Co.,Ltd.
7/106-7 Moo 2, Sukhaprachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120
Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech_cal@yahoo.com, calibratech_cal@hotmail.com

NSC-TISI-TIS17025
CALIBRATION 0030

Certificate of Calibration

Certificate No. : **67-400424-1** **Page : 1 of 2**

Submitted by : Pacific Laboratory Co., Ltd
14/5358 Moo 14, T. Bang Bua Thong, A. Bang Bua Thong, Nonthaburi 11110 Thailand

Equipment : Digital Thermometer with Thermistor probe
Temperature Indicator

Manufacturer :	Eutech	Model :	pH 700
Range :	N/A °C	Resolution :	0.1 °C
Serial No. :	2841305	ID No. :	LAB-PH-002

Thermistor probe

Model :	N/A	Sheath Material :	Stainless
Diameter :	3 mm.	Length :	115 mm.
Serial No. :	PHSTEMB01P 304	ID No. :	LAB-PH-002

Environment : On site calibration was carried out at the Laboratory, Pacific Laboratory Co., Ltd

Ambient Temperature :	(25.0 to 25.6)	°C
Relative Humidity :	(45 to 47)	%
Line Voltage :	(220.0 to 222.0)	VAC

Date of Received : 30 July 2024
Date of Calibration : 30 July 2024
Date of Issue : 03 August 2024
Calibrated by : Permpon Chanpu

Calibration Method : This instrument was calibrated by In-house method comparison technique CAL-M4003 by compared with PRT in the liquid bath at the constant controlled temperature.
The temperature scale used was based on ITS-90

Reference Standard Instruments : This certification is traceable to the International System of Units

1. Platinum Resistance Thermometer (PRT)

ID No.	Cert. No.	Due Date	Traceability
400002	TT-0074-22	23 Aug 2025	National Institute of Metrology Thailand (NIMT)

2. Standard Digital Thermometer

ID No.	Cert. No.	Due Date	Traceability
400033	22E569	25 Apr 2025	National Institute of Metrology Thailand (NIMT)

Approved by :
(Bunjerd Masri)
Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Calibratech Co.,Ltd.
7/106-7 Moo 2, Sukhaprachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120
Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech_cal@yahoo.com, calibratech_cal@hotmail.com

Certificate of Calibration

Certificate No. : 67-400424-1

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Function : Temperature measurement

Immersion Depth (mm.)	Standard Reading (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (±°C)
115	25.005	24.8	0.2	0.19

Remark

UUC : Unit Under Calibration

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

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2 , providing a level of confidence of approximately 95%

- o0o -

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NSC-TISI-TIS17025
CALIBRATION 0030

Certificate of Calibration

Certificate No. : **67-400454-3** **Page : 1 of 2**

Submitted by : Pacific Laboratory Co., Ltd
14/5358 Moo 14, T. Bang Bua Thong, A. Bang Bua Thong, Nonthaburi 11110 Thailand

Equipment : Temperature controlled enclosure (Incubator)

Manufacturer : Aqua Lytic Model : TC 135S

Range : N/A °C Resolution : 0.1 °C

Serial No. : 0614/000033 ID No. : LAB-IB-001

Environment : On site calibration was carried out at the Laboratory, Pacific Laboratory Co., Ltd

Ambient Temperature : (25.5 to 26.0) °C

Relative Humidity : (40 to 45) %

Line Voltage : (220.0 to 222.0) V

Date of Received : 30 July 2024

Date of Calibration : 30 July 2024

Date of Issue : 03 August 2024

Calibrated by : Permpon Chanpu

Calibration Method : CAL-M4004, TLAS G-20

The temperature scale used was based on ITS-90

Reference Standard Instruments : This certification is traceable to the International System of Units

Standard Digital Thermometer with RTD Probe

ID No.	Cert. No.	Due Date	Traceability
400029 & 400043	67-400245-1	27 Oct 2024	National Institute of Metrology Thailand (NIMT)

Approved by :

(Surachai Promthong)

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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CAL

Calibratech Co.,Ltd.

7/106-7 Moo 2, Sukhaprachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120

Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech_cal@yahoo.com, calibratech_cal@hotmail.com

Certificate of Calibration

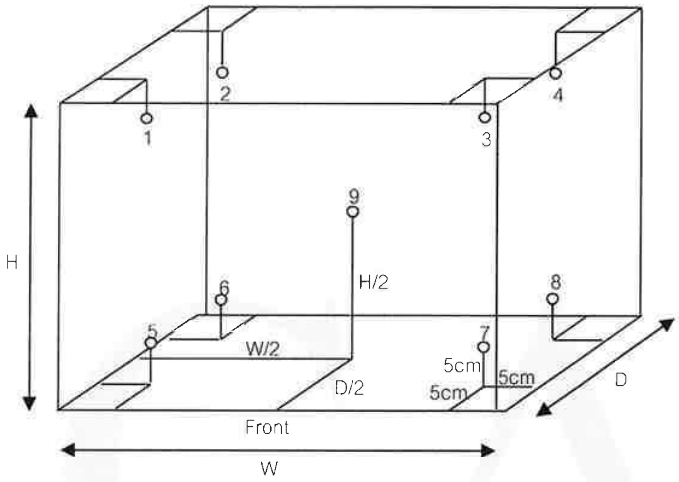
Certificate No. : 67-400454-3

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Function : Temperature measurement

This instrument was setting air ventilation at position 0 (close)



Inside of Chamber

W = 0.51 m

D = 0.04 m

H = 0.70 m

Capacity = 0.02 m^3

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Temperature (°C) @ Sensor No.									Uncertainty (±°C)
			1	2	3	4	5	6	7	8	9	
20.0	20.5	20.5	20.07	19.92	19.95	19.93	19.93	19.92	19.92	19.96	19.88	0.67

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
20.0	20.5	20.5	0.41	0.33	0.70

Remark The uncertainty is not combine uniformity of the air chamber

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

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2 , providing a level of confidence of approximately 95%

- o0o -

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NSC-TISI-TIS17025
CALIBRATION 0030

Certificate of Calibration

Certificate No. : 67-200273-1 **Page : 1 of 2**

Submitted by : Pacific Laboratory Co., Ltd.
14/5358 Moo 14, T.Bang Bua Thong, A.Bang Bua Thong, Nonthaburi 11110 Thailand

Equipment : Electronic Balance

Manufacturer :	SHIMADZU	Model :	AP225WD
Serial No. :	D316301828	ID No. :	LAB-BL-003
Capacity :	220000 mg		
Resolution :	0.01mg/102000mg, 0.1mg/220000mg		

Environment : On site calibration was carried out at the Laboratory, Pacific Laboratory Co., Ltd.

Ambient Temperature :	(26.2 to 26.4)	°C
Relative Humidity :	(34.0 to 35.4)	%
Air Pressure :	1007.0	mbar

Date of Received : 30 July 2024

Date of Calibration : 30 July 2024

Date of Issue : 31 July 2024

Calibrated by : Akaradath Thippichai

Calibration Method : In-house method CAL-M2001 based on UKAS Publication ref : LAB 14 Edition 7 - November 2022

Reference Standard Instruments : This certification is traceable to the International System of Units

Standard Weights

ID No.	Cert. No.	Due Date	Traceability
E261-E2624	C02232088	08 Nov 2024	National Institute of Metrology (Thailand), (NIMT)

Approved by :

(Surachai Promthong)
Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 67-200273-1

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Departure of indication from nominal value

Nominal Value (mg)	Correction (mg)	Uncertainty ± (mg)
1	0.01	0.012
10	0.01	0.012
50	0.01	0.012
100	0.01	0.014
1000	0.00	0.026
2000	0.01	0.034
5000	0.00	0.043
20000	0.00	0.071
50000	0.01	0.11
100000	0.00	0.20
150000	0.0	0.38
200000	0.0	0.38

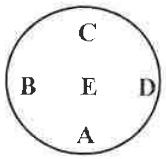
This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty mutiplied by a coverage factor k = 2.06 , providing a level of confidence of approximately 95%

Eccentric error

Load test : 50000 mg

A	B	C	D	E	
0.00	0.00	0.01	0.00	0.00	mg



Repeatability

Load test : 200000 mg

Stdev. : 0.053 mg

- o0o -

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Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech_cal@yahoo.com, calibratech_cal@hotmail.com

NSC-TISI-TIS17025
CALIBRATION 0030

Certificate of Calibration

Certificate No. : **67-400454-2** **Page : 1 of 2**

Submitted by : Pacific Laboratory Co., Ltd
14/5358 Moo 14, T. Bang Bua Thong, A. Bang Bua Thong, Nonthaburi 11110 Thailand

Equipment : Water Bath

Manufacturer :	Memmert	Model :	WNB 22
Range :	N/A °C	Resolution :	0.1 °C
Serial No. :	L514.0184	ID No. :	LAB-WB-001

Environment : On site calibration was carried out at the Laboratory, Pacific Laboratory Co., Ltd

Ambient Temperature	:	(30.0 to 31.3) °C
Relative Humidity	:	(60 to 65) %
Line Voltage	:	(220.0 to 222.0) V

Date of Received : 30 July 2024

Date of Calibration : 30 July 2024

Date of Issue : 03 August 2024

Calibrated by : Permpon Chanpu

Calibration Method : This instrument was calibrated by In-house method CAL-M4006 based on ASTM E715-80
The temperature scale used was based on ITS-90

Reference Standard Instruments : This certification is traceable to the International System of Units

Standard Digital Thermometer with RTD probe

ID No.	Cert. No.	Due Date	Traceability
400029 & 400031	67-400244-1	24 Oct 2024	National Institute of Metrology Thailand (NIMT)

Approved by :

(Surachai Promthong)
Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech_cal@yahoo.com, calibratech_cal@hotmail.com

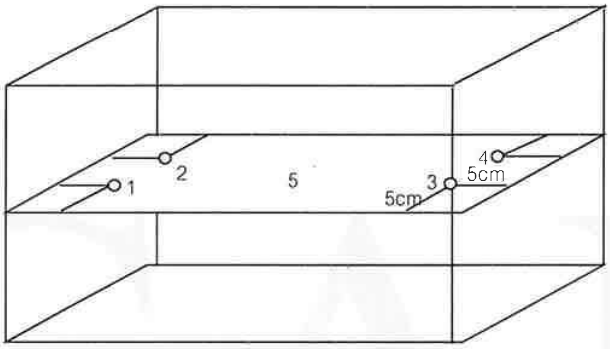
Certificate of Calibration

Certificate No. : 67-400454-2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Function : Temperature measurement



Front

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Temperature (°C) @ Sensor No.					Uncertainty (± °C)	Measured Uniformity (°C)	Measured Stability (°C)
			1	2	3	4	5			
65.0	65.0	65.0	64.61	64.70	64.66	64.64	64.68	0.18	0.12	0.05
95.0	95.0	95.0	94.60	94.69	94.70	94.61	94.70	0.18	0.15	0.03

Remark The uncertainty is not combine uniformity of the water bath

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

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2 , providing a level of confidence of approximately 95%

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List Certificate of Laboratory Instrument

No.	strument/Equipme	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration*	Remark
Laboratory Instrument for Water Quality Analysis									
1	Incubator	Total Coliform Bacteria E. Coli	Binder	KB400 / 20200000015535	National Food Institute, Ministry of Industry, Thailand	2502229 006 01	19 Mar 25	18 Mar 26	-
2	Incubator	Clostridium Perfringens Legionella spp	Memmert	IF 75 / D317.0305	National Food Institute, Ministry of Industry, Thailand	2502229 004 01	20 Mar 25	19 Mar 26	-
3	Incubator	Staphylococcus Aureus Pseudomonas Aeruginosa	Memmert	IN 75 / D317.0307	National Food Institute, Ministry of Industry, Thailand	2502229 005 01	20 Mar 25	19 Mar 26	-
4	Incubator		Memmert	IPP 260 / V615.0187	National Food Institute, Ministry of Industry, Thailand	2502229 001 01	19 Mar 25	18 Mar 26	-
5	Water Bath		Memmert	WNE 14 / L414.1407	Technology Promotion Association (Thailand-Japan)	25TM501	19 Mar 25	18 Mar 26	-
6	Water Bath		Memmert	WNE 14 / L414.1410	Technology Promotion Association (Thailand-Japan)	25TM503	19 Mar 25	18 Mar 26	-
7	Analytical Balance		OHAUS	PX623 / C236754745	National Food Institute, Ministry of Industry, Thailand	2502227-001-01	19 Mar 25	18 Mar 26	-
8	Auto Clave		ALP	CL-40L / 808763	National Food Institute, Ministry of Industry, Thailand	2502229 007 01	19 Mar 25	18 Mar 26	-

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

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

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NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Certificate

Certificate No.: 2502229-006-01

Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Address: 3 Soi Udomsuk 41, Sukhumvit Road,
Bangchack, Prakhanong, Bangkok 10260

Equipment: CHAMBER (Incubator)

Manufacturer: BINDER

Model: KB 400

Serial No.: 20200000015535

ID No.: UAE.MIC.018/2564

Order No.: 2502229

Operation No.: 2502229-006

Date of Receipt: 19 March 2025

Date of Calibration: 19 March 2025

Calibrated by Mr.Jerawut Prapawuttipong
Scientist

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

Date of Issue: 25 March 2025

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

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

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

NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: 2502229-006-01

Equipment: CHAMBER (Incubator)

Model: KB 400 Serial No.: 20200000015535

Resolution: 0.1 °C ID No.: UAE.MIC.018/2564

Manufacturer: BINDER

Date of Calibration: 19 March 2025

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

Environment Condition:

Ambient Temperature (18 ± 1) °C

Relative Humidity (50 ± 5) %

Line Voltage (223 ± 3) Volt

Condition of this results of Calibration:

1. This instrument was calibrated by insert 13 standard thermometer into its chamber and calibration according to W-TE-014 Based on TLAS G-20-1/02-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
   - The temperature scale used was based on ITS - 90.
   - All data show below were final values and the initial data may be obtained upon request.
2. Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY49016851	TE 670477-01	4 May 2025	NATIONAL FOOD INSTITUTE
	RTD	CH#201-303 / RTD#201-303			

3. This certificate is traceable to International System of Units (SI Units).
4. This certificate was certified only for the instrument we calibrated.
5. This result of calibration was found accurate as shown on date and place of calibration only.
6. Condition of Calibrated item : Good

   UUC Description :

   Time of Record 1 Hour 9 Minute At 35.0 °C

   Fresh air Damper [-] Open Position [-]

   [X] Close Fan [-]

   [-] Not Available
7. Result of Calibration : [X] Without adjustment [ ] After adjustment

P. Joenghanlit
25 March 2025

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NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: 2502229-006-01

Equipment: CHAMBER (Incubator)

Model: KB 400 Serial No.: 20200000015535

Resolution: 0.1 °C ID No.: UAE.MIC.018/2564

Manufacturer: BINDER

Date of Calibration: 19 March 2025

Calibration point: 35.0 °C

Calibration result:

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

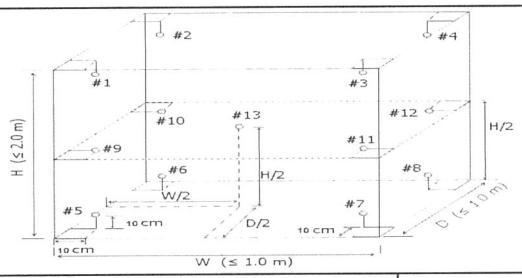


Table1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.13 is REF)													Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	
35.0	34.98	35.17	34.99	34.92	35.18	35.01	35.00	35.13	35.00	34.96	35.02	35.17	35.04	0.27

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading (°C)			Temperature Stability ± (°C)	Temperature Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
35.0	35.0	35.0	35.0	0.029	0.15	0.30

Note The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity) "

UUC* = Unit Under Calibration

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

Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.

Overall Variation = The difference of the maximum and minimum measured temperatures througout observation time.

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

--------- End ---------

P. Jaenghanit

25 March 2025

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

NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Certificate

Certificate No.: 2502229-004-01

Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Address: 3 Soi Udomsuk 41, Sukhumvit Road,
Bangchack, Prakhanong, Bangkok 10260

Equipment: CHAMBER (Incubator)

Manufacturer: MEMMERT

Model: IN75

Serial No.: D317.0305

ID No.: UAE.MIC.022/2561

Order No.: 2502229

Operation No.: 2502229-004

Date of Receipt: 19 March 2025

Date of Calibration: 20 March 2025

Calibrated by Mr.Yothin Charoensuk
Scientist

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

Date of Issue: 25 March 2025

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

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

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CALIBRATION 0061

Calibration Report

Certificate No.: 2502229-004-01

Equipment: CHAMBER (Incubator)

Model: IN75 Serial No.: D317.0305

Resolution: 0.1 °C ID No.: UAE.MIC.022/2561

Manufacturer: MEMMERT

Date of Calibration: 20 March 2025

Location: 302, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Environment Condition:

Ambient Temperature (28.8 ± 1) °C

Relative Humidity (59 ± 1) %

Line Voltage (223 ± 3) Volt

Condition of this results of Calibration:

1. This instrument was calibrated by insert 9 standard thermometer into its chamber and calibration according to W-TE-014 Based on TLAS G-20-1/02-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
   - The temperature scale used was based on ITS - 90.
   - All data show below were final values and the initial data may be obtained upon request.
2. Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY57003188	TE 670486-01	8 June 2025	NATIONAL FOOD INSTITUTE
	RTD	CH#101-109/ RTD#101-109			

3. This certificate is traceable to International System of Units (SI Units).
4. This certificate was certified only for the instrument we calibrated.
5. This result of calibration was found accurate as shown on date and place of calibration only.
6. Condition of Calibrated item : Good

   UUC Description :

   Time of Record 1 Hour 9 Minute At 41.5 °C

   Fresh air Damper
   - [-] Open
   - [X] Close
   - [-] Not Available

   Position [-]

   Fan [100%]

7. Result of Calibration : [X] Without adjustment [ ] After adjustment

P. Joenghanbut
25 March 2025

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

NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: 2502229-004-01

Equipment: CHAMBER (Incubator)

Model: IN75 Serial No.: D317.0305

Resolution: 0.1 °C ID No.: UAE.MIC.022/2561

Manufacturer: MEMMERT

Date of Calibration: 20 March 2025

Calibration point: 41.5 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	28.6	58	220.0
MAX	28.9	60	225.0

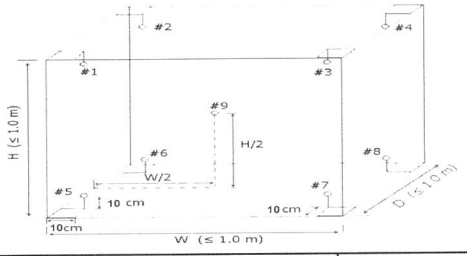


Table1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
41.5	41.50	41.39	41.45	41.40	41.69	41.35	41.29	41.32	41.34	0.27

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
41.5	41.5	41.5	41.5	0.023	0.34	0.44

Note The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity) "

UUC* = Unit Under Calibration

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

Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.

Overall Variation = The difference of the maximum and minimum measured temperatures througout observation time.

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

--------- End ---------

P. Jrenghalit
25 March 2025

เอกสารไม่ควบคุม

2008 ซอยอรุณอมรินทร์ 36 ถนนอรุณอมรินทร์ แขวงบางยี่ขัน เขตบางพลัด กรุงเทพมหานคร 10700
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Foundation for Industrial Development National Food Institute
Food Industrial Laboratory Service Center

NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Certificate

Certificate No.: 2502229-005-01

Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Address: 3 Soi Udomsuk 41, Sukhumvit Road,
Bangchack, Prakhanong, Bangkok 10260

Equipment: CHAMBER (Incubator)

Manufacturer: MEMMERT

Model: IN75

Serial No.: D317.0307

ID No.: UAE.MIC.023/2561

Order No.: 2502229

Operation No.: 2502229-005

Date of Receipt: 19 March 2025

Date of Calibration: 19 March 2025

Calibrated by Mr.Yothin Charoensuk
Scientist

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

Date of Issue: 25 March 2025

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

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

เอกสารไม่ควบคุม

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

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NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: 2502229-005-01

Equipment: CHAMBER (Incubator)

Model: IN75 Serial No.: D317.0307

Resolution: 0.1 °C ID No.: UAE.MIC.023/2561

Manufacturer: MEMMERT

Date of Calibration: 19 March 2025

Location: 302, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Environment Condition:

Ambient Temperature (20.9 ± 1) °C

Relative Humidity (59 ± 1) %

Line Voltage (223 ± 3) Volt

Condition of this results of Calibration:

1. This instrument was calibrated by insert 9 standard thermometer into its chamber and calibration according to W-TE-014 Based on TLAS G-20-1/02-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
   - The temperature scale used was based on ITS - 90.
   - All data show below were final values and the initial data may be obtained upon request.
2. Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY57003188	TE 670486-01	8 June 2025	NATIONAL FOOD INSTITUTE
	RTD	CH#101-109/ RTD#101-109			

3. This certificate is traceable to International System of Units (SI Units).
4. This certificate was certified only for the instrument we calibrated.
5. This result of calibration was found accurate as shown on date and place of calibration only.
6. Condition of Calibrated item : Good

   UUC Description :

   Time of Record 1 Hour 9 Minute At 41.0 °C

   Fresh air Damper [-] Open Position [-]

   [X] Close Fan [-]

   [-] Not Available
7. Result of Calibration : [X] Without adjustment [ ] After adjustment

P. Joenghalit

25 March 2025

เอกสารไม่ควบคุม

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NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: 2502229-005-01

Equipment: CHAMBER (Incubator)

Model: IN75 Serial No.: D317.0307

Resolution: 0.1 °C ID No.: UAE.MIC.023/2561

Manufacturer: MEMMERT

Date of Calibration: 19 March 2025

Calibration point: 41.0 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	20.6	58	220.0
MAX	21.2	60	225.0

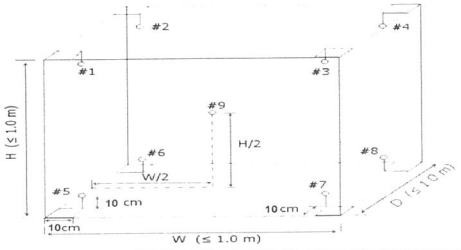


Table1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
41.0	41.78	41.48	41.56	41.50	41.11	41.05	40.87	41.00	41.06	0.34

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
41.0	41.0	41.0	41.0	0.12	0.72	1.1

Note The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity) "

UUC* = Unit Under Calibration

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

Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.

Overall Variation = The difference of the maximum and minimum measured temperatures througout observation time.

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

--------- End ---------

P. Jaenghalit
25 March 2025

เอกสารไม่ควบคุม

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

NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Certificate

Certificate No.: 2502229-001-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road,
Bangchack, Prakhanong, Bangkok 10260

Equipment: CHAMBER (Incubator)
Manufacturer: MEMMERT
Model: IPP 260
Serial No.: V615.0187
ID No.: UAE.MIC.003/2559
Order No.: 2502229
Operation No.: 2502229-001
Date of Receipt: 19 March 2025
Date of Calibration: 19 March 2025

Calibrated by Mr.Jerawut Prapawuttipong
Scientist

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

Date of Issue: 25 March 2025

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

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

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Foundation for Industrial Development National Food Institute
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NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: 2502229-001-01

Equipment: CHAMBER (Incubator)

Model: IPP 260 Serial No.: V615.0187

Resolution: 0.1 °C ID No.: UAE.MIC.003/2559

Manufacturer: MEMMERT

Date of Calibration: 19 March 2025

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

Environment Condition:

Ambient Temperature (16.2 ± 1) °C

Relative Humidity (32 ± 4) %

Line Voltage (223 ± 3) Volt

Condition of this results of Calibration:

1. This instrument was calibrated by insert 9 standard thermometer into its chamber and calibration according to W-TE-014 Based on TLAS G-20-1/02-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
   - The temperature scale used was based on ITS - 90.
   - All data show below were final values and the initial data may be obtained upon request.
2. Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY49016851	TE 670477-01	4 May 2025	NATIONAL FOOD INSTITUTE
	RTD	CH#101-109/ RTD#101-109			

3. This certificate is traceable to International System of Units (SI Units).
4. This certificate was certified only for the instrument we calibrated.
5. This result of calibration was found accurate as shown on date and place of calibration only.
6. Condition of Calibrated item : Good

   UUC Description :

   Time of Record 1 Hour 9 Minute At 35.0 °C

   Fresh air Damper [-] Open Position [-]

   [X] Close Fan [-]

   [-] Not Available
7. Result of Calibration : [X] Without adjustment [ ] After adjustment

P. Joenghanlit
25 March 2025

เอกสารไม่ควบคุม

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

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NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: 2502229-001-01

Equipment: CHAMBER (Incubator)

Model: IPP 260 Serial No.: V615.0187

Resolution: 0.1 °C ID No.: UAE.MIC.003/2559

Manufacturer: MEMMERT

Date of Calibration: 19 March 2025

Calibration point: 35.0 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	15.5	28	220.0
MAX	17.1	35	225.0

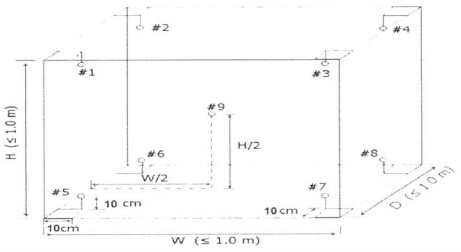


Table1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
35.0	34.94	34.95	34.91	34.93	35.15	35.01	34.98	35.05	35.12	0.29

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
35.0	35.0	35.0	35.0	0.10	0.21	0.35

Note The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity) "

UUC* = Unit Under Calibration

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

Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.

Overall Variation = The difference of the maximum and minimum measured temperatures througout observation time.

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

--------- End ---------

P. Jaenghalit
25 March 2025

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เอกสารไม่ควบคุม

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL.0-2717-3000-29 FAX.0-2719-9484

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NSC-TISI-TIS17025
CALIBRATION 0008

Certificate of Calibration

Cert. No.: 25TM501

Equipment :	Water Bath
Manufacturer :	Memmert
Model :	WNE 14
Serial No. :	L414.1407
ID No. :	UAE.MIC.006/2558
Submitted by :	United Analyst and Engineering Consultant Co.,Ltd. 3 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260
Location :	Microbiology Laboratory (302)
Received Order :	19 March 2025
Calibration Date :	19 March 2025
Ambient Temperature :	(26 ± 10) °C
Relative Humidity :	(50 ± 30) %
AC Line Voltage :	(220 ± 22) V
Calibrated by :	Krisda Malee
Approved by :	Kunchit Approved Signatory

( ) Chakrit Waewwanjua
( ) Suwit Imjai
(✓) Kunchit Promprat

Issue Date : 27 March 2025

The Uncertainties are for a confidence probability of approximately 95%

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เอกสารไม่ควบคุม

Equipment : Water Bath **Cert. No.:** 25TM501
Condition As-Received : Used Item **Page :** 2 of 3
Reference : 2503-0436OC-1
Procedure Used :-

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

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

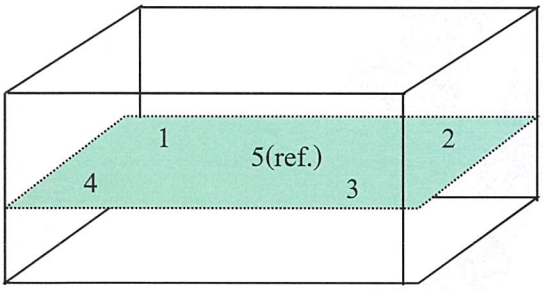
Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY57013823	23LM71	TPA	12 May 2025

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

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

Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Heat transfer medium used : Water

	Environmental		AC Voltage Supply
	(°C)	(%R.H.)	(Volt)
Beginning of Calibration	24	50	220
Finished of Calibration	25	53	221



Front

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

เอกสารไม่ควบคุม

Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2503-0436OC-1
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source

Cert. No.: 25TM501

Calibration point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Average* Standard Reading (°C) Position					Uncertainty (± °C)
			1	2	3	4	5 (ref.)	
44.5	44.4	44.4	44.508	44.531	44.495	44.537	44.510	0.15

Calibration point (°C)	Uniformity (°C)	Stability (± °C)	Coverage Factor *k*
44.5	0.092	0.048	2

Average* : The average of 30 values in each position.
Uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Stability : One-half of the greatest maximum difference of measured temperature at any one probe.
UUC* : Unit Under Calibration
Note : The reported uncertainty of measurement was included stability and excluded uniformity.

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

-o0o-

เอกสารไม่ควบคุม

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
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TEL.0-2717-3000-29 FAX.0-2719-9484

NSC-TISI-TIS17025
CALIBRATION 0008

Certificate of Calibration

Cert. No.: 25TM503

Equipment :	Water Bath
Manufacturer :	Memmert
Model :	WNE 14
Serial No. :	L414.1410
ID No. :	UAE.MIC.015/2565
Submitted by :	United Analyst and Engineering Consultant Co.,Ltd. 3 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260
Location :	Microbiology Laboratory (302)
Received Order :	19 March 2025
Calibration Date :	19 March 2025
Ambient Temperature :	(26 ± 10) °C
Relative Humidity :	(50 ± 30) %
AC Line Voltage :	(220 ± 22) V

Calibrated by : Krisda Malee

Approved by : Kunchit

Approved Signatory

( ) Chakrit Waewwanjua
( ) Suwit Imjai
(✓) Kunchit Promprat

Issue Date : 27 March 2025

The Uncertainties are for a confidence probability of approximately 95%

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เอกสารไม่ควบคุม

Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2503-0436OC-3

Cert. No.: 25TM503

Procedure Used :-

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

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

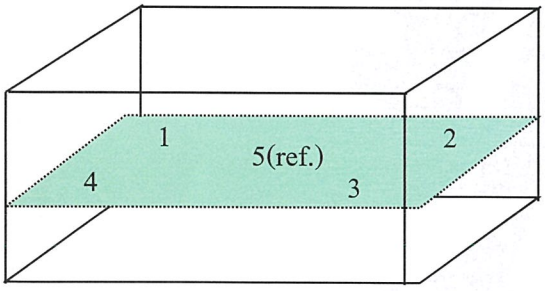
Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY57013823	23LM71	TPA	12 May 2025

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

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

Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Heat transfer medium used : Water

	Environmental		AC Voltage Supply
	(°C)	(%R.H.)	(Volt)
Beginning of Calibration	24	51	221
Finished of Calibration	25	52	220



Front

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

เอกสารไม่ควบคุม

Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2503-0436OC-3
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source

Cert. No.: 25TM503

Calibration point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Average* Standard Reading (°C) Position					Uncertainty (± °C)
			1	2	3	4	5 (ref.)	
44.5	44.5	44.5	44.533	44.509	44.527	44.518	44.517	0.15

Calibration point (°C)	Uniformity (°C)	Stability (± °C)	Coverage Factor *k*
44.5	0.057	0.038	2

Average* : The average of 30 values in each position.
Uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Stability : One-half of the greatest maximum difference of measured temperature at any one probe.
UUC* : Unit Under Calibration
Note : The reported uncertainty of measurement was included stability and excluded uniformity.

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

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

NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Certificate

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

Equipment: Electronic Balance

Manufacturer: OHAUS

Model: PX623

Serial No.: C236754745

ID No.: UAE.MIC.055/2565

Order No.: 2502227

Operation No.: 2502227-001

Date of Receipt: 19 March 2025

Date of Calibration: 19 March 2025

Calibrated by Mr.Yothin Charoensuk
Scientist

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

Date of Issue: 25 March 2025

The uncertainties are for a confidence probability of approximately 95%

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Food Industrial Laboratory Service Center

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NSC THAILAND
NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: **2502227-001-01**

Equipment: Electronic Balance

Manufacturer: OHAUS

Model: PX623

Resolution: 0.001

Serial No.: C236754745

ID No.: UAE.MIC.055/2565

Capacity: 620

Date of Calibration: 19 March 2025

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

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

Condition of Equipment: Good Condition

Condition of This Results of Calibration:

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

2. Reference Standards:

Reference Standard	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Standard Weight Class E2	1mg to 200g	B505567572	TCS	M2404100S	19 April 2025
Standard Weight Class E2	500g	B505567696	TCS	M2404101S	19 April 2025
Instrument	**Model**	**Serial No.**	**Calibrated By**	**Certificate No.**	**Due Date**
Thermo-Hygro Meter	608-H1	NFI.BTH 017/23	Quality Reborn	QR25-0542	10 February 2026

3. This certification is traceable to SI UNIT

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

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

Calibration Results:

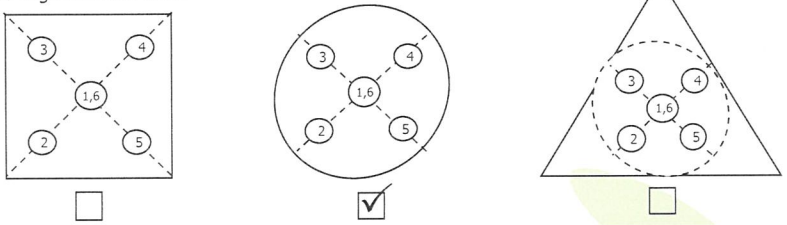
1. Repeatability of Reading:

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

2. Off-Center Error:

A mass of 200 g was placed and moved to various position on pan.

The balance reading obtained is given in the table.



☐ ☑ ☐

1 (g)	2 (g)	3 (g)	4 (g)	5 (g)	6 (g)	(Maximum Difference) (g)
200.002	200.003	200.001	200.001	200.002	200.002	0.001

for N. myoubat

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NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: **2502227-001-01**

Equipment: Electronic Balance

Manufacturer: OHAUS

Model: PX623

Resolution: 0.001

Serial No.: C236754745

ID No.: UAE.MIC.055/2565

Capacity: 620

Date of Calibration: 19 March 2025

Calibration Results: **(Continued)**

Calibration Range: 0-600 g

Calibration Adjustment: Internal Calibration

3. Departure from Nominal Value:

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

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

---------- **End** ----------

for. N. Inyaubol

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THAILAND
NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Certificate

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

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

Calibrated by Mr.Jerawut Prapawuttipong
Scientist

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

Date of Issue: 25 March 2025

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

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NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: 2502229-007-01

Equipment: Autoclave

Model: CL-40L Serial No.: 808763

Resolution: 0.1 °C ID No.: UAE.MIC.026/2563

Manufacturer: ALP

Date of Calibration: 19 March 2025

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

Environment Condition:

Ambient Temperature (23 ± 1) °C

Relative Humidity (60 ± 5) %

Line Voltage (225 ± 1) Volt

Condition of this results of Calibration:

1. This instrument was calibrated by insert 3 standard Data loggers with RTD into its autoclave and calibration according to W-TE-018 based on BS 2646-1:2021, Autoclaves for sterilization in laboratories Part 1: Design, construction, safety and performance - Specification.
   - The temperature scale used was based on ITS - 90.
   - All data show below were final values and the initial data may be obtained upon request.
2. Reference Standard Instrument :

Instrument	Model	Serial No.	Certificate No.	Due Date	Through
Digital Thermometer with RTD (Data Logger)	HiTemp140-PT	S35646	TE 670370-01	23-Mar-25	NATIONAL FOOD INSTITUTE
	HiTemp140-PT	S33753	TE 670371-01	23-Mar-25	NATIONAL FOOD INSTITUTE
	HiTemp140-PT	S29973	TE 670372-01	23-Mar-25	NATIONAL FOOD INSTITUTE

3. This certificate is traceable to International System of Units (SI Units).
4. This certificate was certified only for the instrument we calibrated.
5. This result of calibration was found accurate as shown on date and place of calibration only.
6. This standard does not apply to sterilizers or disinfectors used for medical, dental, pharmaceutical.
7. Condition of Calibrated item : Good

   UUC Description : Setting program function sterilization : STERILIZE/NORMAL

   Time of sterilization 15 Minute At 115.0 aand 121.0 °C
8. Result of Calibration :
   - [X] Without adjustment
   - [ ] After adjustment

P. Joenghanbit
25 March 2025

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CALIBRATION 0061

Calibration Report

Certificate No.: 2502229-007-01

Equipment: Autoclave

Model: CL-40L Serial No.: 808763

Resolution: 0.1 °C ID No.: UAE.MIC.026/2563

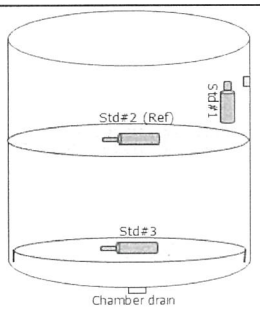
Manufacturer: ALP

Date of Calibration: 19 March 2025

Calibration point: 115.0 aand 121.0 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
Min	22.0	55	224
Max	24.0	65	226



Standard at Position

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

Table1 : Reporting of Temperature

Calibration Point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.2 is REF)			Uncertainty ± (°C)
	Std.# 1	Std.# 2 (Ref)	Std.# 3	
115.0	115.32	115.46	115.22	0.64
121.0	121.31	121.53	121.31	0.64

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading				Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	Min (°C)	Max (°C)	Average (°C)	MPa			
115.0	115.0	115.1	115.0	0.08	0.11	0.12	0.26
121.0	121.0	121.1	121.0	0.12	0.13	0.15	0.29

Note

The quoted uncertainty include " Stability " and " Loading effect (20% of Uniformity)"

UUC* = Unit Under Calibration

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

Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.

Overall Variation = The difference of the maximum and minimum measured temperatures througout observation time.

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

--------- End ---------

P. Joengbanlit
25 March 2025

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