

ภาคผนวก ง
เอกสารสอบเทียบเครื่องมือ

List of Instrument Certificates for Environmental Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration*
1	Analytical Balance	FAT OIL AND GREASE	Mettler Toledo	AB204-S/FACT / 1129361010	United Analyst and Engineering Consultant Co., Ltd.	250422 1 BL002 25	23/4/2025	22/4/2026
2	Analytical Balance	TOTAL DISSOLVED SOLIDS	Mettler Toledo	XSR205DU / C210685394	National Food Institute,Ministry of Industry, Thailand	25022226-002-01	20/3/2025	19/3/2026
3	Analytical Balance	TOTAL SUSPENDED SOLIDS	Mettler Toledo	XSR205DU / C009071872	National Food Institute,Ministry of Industry, Thailand	25022226-001-01	20/3/2025	19/3/2026
4	DO Meter	BIOCHEMICAL OXYGEN DEMAND	YSI	5100 / 11B 101863	Technology Promotion Association (Thailand-Japan)	25TW29	17/2/2025	16/2/2026
5	Digestion Units	TOTAL KJELDAHL NITROGEN	Foss Tecator	2520 Auto / 91794469	United Analyst and Engineering Consultant Co., Ltd	แบบบันทึกผลการทวนสอบค่า ห้อง UAE.WAS.011/2560	13/11/2025	12/5/2026
6	Incubator	TOTAL COLIFORM BACTERIA	Binder	K8400 / 20220000022479	National food institute ministry of Industry	2503682 004 01	1/7/2025	30/6/2026
7	Incubator	LEGIONELLA SP. LEGIONELLA SPP. (ACID)	Memmert	IPP260 / V616.0066	National Food Institute, Ministry of Industry, Thailand	25022229-002-01	19/3/2025	18/3/2026
8	Kjeltec System Distilling Unit	TOTAL KJELDAHL NITROGEN	Foss Tecator (Labtec)	KT200 / 91790524	FOSS South East Asia	13319	27/1/2025	26/1/2026
9	Kjeltec Distillation Unit	TOTAL KJELDAHL NITROGEN	FOSS	Kjeltec 8100 / 91889052	FOSS South East Asia	13854	24/2/2025	23/2/2026
10	pH Meter	pH	Horiba	LAQUA-PH210 / HAOA0005	technology promotion association (thailand-japan	25CH1433	11/12/2025	10/12/2026

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

Certificate of Calibration

Certificate No.: 250422-1-BL002-25

Code No.: BL002-25

Page: 1 of 3

Customer Name: United Analyst and Engineering Consultant Co., Ltd.
Address: 3 Soi Udom suk 41, Sukhumvit Rd., Bang Chak, Phar Khanong, Bangkok 10260

Equipment: Electronic Balance

Manufacturer: Mettler Toledo

Model: AB204-S/FACT

Serial No.: 1129361010

Asset No.: UAE.WAS.002/2552

Building: N/A

Floor: 1

Room: 107

Received Date: April 22, 2025

Date of Calibration: April 23, 2025

Calibration Conditions:
Temperature 22.8 °C to 23.4 °C
Humidity 54.8 % to 68.9 %
Pressure 756.6 mmHg to 758.2 mmHg

Calibrated by: Sakkarin Srirahang

Approved by: Suwit Chotnok

Issued Date: April 25, 2025

Signature:

Suwit Chotnok

Note: 1) The Uncertainties are for a confidence probability of approximately 95%

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

3) This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the United Analyst and Engineering Consultant Co., Ltd. (UAE)

เอกสารไม่ควบคุม

Certificate No.: 250422-1-BL002-25

Code No.: BL002-25

Page: 2 of 3

Equipment: Electronic Balance
Model: AB204-S/FACT
Manufacturer: Mettler Toledo
Readability: 0.0001 g

Serial No.: 1129361010
ID No.: UAE.WAS.002/2552

Max. Capacity: 220 g

Calibration Date: April 23, 2025

Condition As-Received: In Condition

Condition of Equipment:

Condition of This Result of Calibration:

1. Calibration Method: This instrument was calibrated by method UAE.CP.CAL.006 In-House Method based on UKAS Lab 14 : 2022

2. Reference Standards:

Reference Standard:	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Standard Weight Class E2 (OIML)	1 mg to 1 kg	8749109122	ANARC	25-009359	Mettler-Toledo	21-Jan-27
Standard Weight Class F1 (OIML)	1 mg to 200 g	11119512	ANARC	24-013840	Mettler-Toledo	04-Feb-26
Instrument	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Thermo-Hygro-Baro Meter	MHB-382SD	AK-66457	SUCCESS	56-H-00997/67	Success Gateway	21-Nov-25
Thermo-Hygro-Baro Meter	MHB-382SD	AK-66457	TPA	25P705	TPA	25-Feb-26

3. This certification is traceable to SI Unit

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

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

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

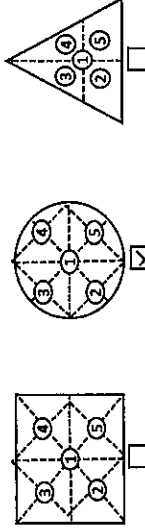
Calibration Result:

Repeatability of Reading:	Nominal Value (g)	Standard Deviation of Reading (g)
	200*	0.000045

2. Eccentric or off-center loading

A mass of 100 g was placed and moved to various positions on pan

The Balance reading obtained is given in the table.



1	2	3	4	5	Maximum Difference (g)
(g)	(g)	(g)	(g)	(g)	
100.0000	99.9996	99.9997	100.0003	100.0005	0.0005

เอกสารไม่ควบคุม



UAE
UNITED ANALYST AND ENGINEERING CONSULTANT COMPANY LIMITED
33 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260
United Analyst and Engineering Consultant Co., Ltd.
Tel: 0 2763 2828 Fax: 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com

มูลนิธิเพื่อการพัฒนาภาคอุตสาหกรรม
ศูนย์บริการห้องปฏิบัติการอุตสาหกรรมอาหาร
Foundation for Industrial Development National
Food Industrial Laboratory Service Center



Calibration Certificate

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

Page 1 of 4

Calibration Adjustment, Internal Calibration

3. Error of indication from nominal or conventional mass value:						
Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty ($\pm$ mg)	Coverage Factor k	
Unload	0.0000000	0.0000	0.0000	0.10	2.05	
0.01	0.0100025	0.0099	0.0001	0.10	2.05	
0.05	0.0500036	0.0500	0.0000	0.10	2.05	
0.1	0.1000012	0.0999	0.0001	0.10	2.05	
0.5	0.5000133	0.5000	0.0000	0.10	2.05	
1	1.0000105	1.0000	0.0000	0.10	2.05	
10	10.000010	10.0000	0.0000	0.11	2.04	
40	40.000076	40.0000	0.0000	0.14	2.00	
50	50.000056	50.0000	0.0001	0.13	2.00	
80	80.000107	80.0000	0.0001	0.18	2.00	
100	100.000109	99.9999	0.0002	0.17	2.00	
120	120.000015	119.9999	0.0003	0.21	2.00	
150	150.000165	149.9998	0.0003	0.24	2.00	
160	160.000175	159.9997	0.0005	0.26	2.00	
200	200.000129	199.9998	0.0004	0.30	2.00	

4. Effect of Tare test:

Tare Load (g)	Test Load (g)	Indication (g)	Correction (g)
100	20.000041	19.9999	0.0001
	40.000076	39.9998	0.0002
	60.000066	59.9997	0.0003
	80.000107	79.9999	0.0002
	100.000168	100.0004	-0.0003

Remark:

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k , providing

0--0-End-0-0

ES-000 Revision: 01 Date: 70-04-65

The uncertainties are for a confidence probability of approximately 95%

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

Calibrated by	Mr.Yothin Charoensuk	Approved by	for N. ingubats (Mr.Pheraphat Tuanjit) Scientist
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Date of Issue:	25 March 2025
Manager, Division of Calibration Laboratory	Responsible for the Technical Management Team



Calibration Report

Certificate No.: 25022226-001-01

Equipment:

Manufacturer: METTLER TOLEDO

Model: XSR205DU

Resolution: 0.0001 g / 0.0001 g

Serial No.: C09071872

ID No.: UAE.WAQ.012/2563

Capacity: 82 g / 220 g

Date of Calibration: 20 March 2025

Page 2 of 4

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

Place of Calibration: 208 Balance Room, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Condition of Equipment: Good Condition

Condition of This Results of Calibration:

1. Calibration Method: NFI Method W-M4-001 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	8505567572	TCS	M24041005	19 April 2025
Instrument	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Thermo-Hygro Meter	608-H1	NFI BTH 017/23	Quality Reborn	QR25-0542	10 February 2026

3. This 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:

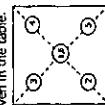
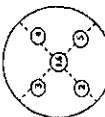
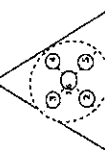
1. Repeatability of Reading:

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

2. Off-Center Error:

A mass of 100 g was placed and moved to various position on pan.

The balance reading obtained is given in the table.

		
1 (g) 100.0001	2 (g) 100.0001	3 (g) 100.0001
4 (g) 100.0001	5 (g) 100.0001	6 (g) 100.0002
(Maximum Difference) (g) 0.0001		

for N. Nijmabadi

ECS-012 Revision-01 Date: 20.04.65



Calibration Report

Certificate No.: 25022226-001-01

Equipment:

Manufacturer: METTLER TOLEDO

Model: XSR205DU

Resolution: 0.0001 g / 0.0001 g

Serial No.: C09071872

ID No.: UAE.WAQ.012/2563

Capacity: 82 g / 220 g

Date of Calibration: 20 March 2025

Page 3 of 4

Calibration Results: (Continued)

Calibration Range: 0-80 g

Calibration Adjustment: Internal Calibration

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

Nominal Value (g)	Standard Value (g)	Average Reading (g)	Correction (g)	Uncertainty (± g)	Coverage Factor k
Unidad	0.000000	0.000000	0.000000	0.0000089	2.00
0.001	0.001003	0.001000	0.000000	0.0000092	2.00
0.005	0.005002	0.005000	0.000000	0.0000094	2.00
0.01	0.010003	0.010000	0.000000	0.0000091	2.00
0.05	0.049996	0.050000	0.000000	0.0000088	2.00
0.1	0.100011	0.100000	0.000001	0.000011	2.00
0.5	0.500016	0.500000	0.000002	0.000014	2.00
1	1.000003	1.000001	-0.000001	0.000016	2.00
2	2.000023	2.000005	-0.000003	0.000017	2.00
5	5.000015	5.000005	-0.000003	0.000021	2.00
10	10.000009	10.000005	-0.000004	0.000026	2.00
20	20.000030	20.000012	-0.000009	0.000037	2.00
30	30.000039	30.000012	-0.000008	0.000050	2.00
50	50.000028	50.000014	-0.000011	0.000068	2.00
80	80.000067	80.000020	-0.000013	0.00011	2.00

for N. Nijmabadi

ECS-012 Revision-01 Date: 20.04.65



Calibration Report

Certificate No.: 2502226-001-01

Equipment:

Electronic Balance

Manufacturer: METTLER TOLEDO

Model: XSR2050U

Resolution: 0.0001 g / 0.0001 g

Serial No.: C09071872

ID No.: UAE.WAO.012/2563

Capacity: 82 g / 220 g

Date of Calibration: 20 March 2025

Page 4 of 4

Calibration Results: (Continued)

Calibration Range: >80-200 g

Calibration Adjustment: Internal Calibration

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

Nominal Value (g)	Standard Value (g)	Average Reading (g)	Correction (g)	Uncertainty (± g)	Coverage Factor k
90	90.00010	90.0002	-0.0001	0.00015	2.00
100	100.00006	100.0001	0.0000	0.00016	2.00
110	110.00007	110.0001	0.0000	0.00017	2.00
120	120.00009	120.0002	-0.0001	0.00018	2.00
130	130.00010	130.0002	-0.0001	0.00019	2.00
140	140.00013	140.0002	-0.0001	0.00019	2.00
150	150.00009	150.0002	-0.0001	0.00021	2.00
160	160.00010	160.0002	-0.0001	0.00022	2.00
170	170.00012	170.0003	-0.0001	0.00023	2.00
200	200.00013	200.0002	-0.0001	0.00028	2.00

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

----- End -----

for N. Nipobak

FC-S-012 Revision: 01 Date: 20-04-65



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 13, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000 FAX. 0-2719-9484

Certificate of Testing

Cert.No.: 25TW29
Page.: 1 of 2

Equipment : DO Meter
Manufacturer : YSI
Model : 5100
Serial No. : 11B 101863
ID No. : UAE.WAO.004/2554
Received Date : 14 February 2025
Test Date : 17 February 2025
Reference : 2502-0473DSC-1

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

Laboratory Condition : Temperature (25 ± 5) °C
Humidity (50 ± 20) %

Test Procedure : In - house method : CP-CH9
by Comparison Technique with Azide Modification Method

Tested by : Walalak Sirithean

Sailthip

Approved by : Approved Signatory

() Chakrit Waewwanjua
() Ponpan Paipim
(✓) Sailthip Meangmai

Issue Date : 18 February 2025

เอกสารไม่ควบคุม

เอกสารไม่ควบคุม

บันทึกผลการทวนสอบใบรับรองการสอบเทียบ (Verification of Certificate)

Certificate No. : 25TW29					Equipment : Do Meter		
Brand : YSI					Model : 5100		
Serial No. : 118 101863					ID No. : UAE.WAO.004/2554		
Calibration results							
Titration Method	Standart Deviation	Do meter Reading	Error%	Correction%	Error Total Error	Judgement	(Total Error < Judgement)
(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(± mg/L)	(mg/L)
8.22	0.0055	8.22	0.0000	0.0000	0.0	0.02	pass
ผู้บันทึก.....อิศรา..บุญประกอบ.....					ผู้ตรวจสอบ..... <u>พรวิมล</u>		
วันที่.....28/02/2025.....					วันที่..... <u>28 ก.พ. 67</u>		
หมายเหตุ :							

บันทึกฉบับ

\\uae.net\app\Netapp_LAB\ab-BK\INSTRUMENT (LI-276-4)\Certificate UAE\บันทึกผลการทวนสอบใบรับรองการสอบเทียบเครื่องวัด DO meter WAO 004 2554

Cert.No.: 25TW29
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1. Burette	-	130BU10	23CG1172	22 Mar 2025
2. Balance	14233821	110RC001	24MM131	04 July 2025

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate 5-Hydrate AR	KEMAUS	2203162447	99.6%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 24F100202

Titration Method (Azide Modification Method)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.22	8.22	0.0055

This report was certified only for the instrument we tested.It is allowable to use for study
Intend to use for advertising and referral purpose is prohibited.This report may not be reproduced
other in full, without written approval of the laboratory

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เอกสารไม่ควบคุม

FOSS

Customer Service Report

Date: Jan 27, 2025
Job No.: 11615
Instrument: K1200

Travel To Customer (Hrs)
09:00
10:00

Labour (Hrs)
10:00
13:00

Travel From Customer (Hrs)
3
-

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

PMA Type		Smartcare		Smartcare Pro		Foscare Pro	

Details of Work / Test	
- DM -	
+ Visual Check -	
- No leak	-ok
- Valve damage on heater & main switch	-not ok
- Subsea heater 100. main switch 100.000V Vao	-ok
- P1 (Subsea PM Kit #1307	-ok
- P Function Check	
- Power on OFF	ok
- Alarm	
- Steam	
- Condenser	
- Water pump	-ok

Part No:	Batch	Description	Qty
100.59965	11-06-2024	FOSD PM KIT K1200 Heater Analyser / 2100	1
100.55112	24.03.2024	Heating element 8 team	1
1563011	10-10-2022	Unit for R595Kmt-2 Pa	1

I confirm this report is accurate and complete

Signed FOS: [Signature]
Name: [Name]
Signed Customer: [Signature]
Name: [Name]

Email: [Email]
Customer Contact: [Customer Contact]
*Remark: [Remark]

FOSS

Customer Service Report

Date: 24 February 2025
Job No.: 11735
Instrument: K1800

Travel To Customer (Hrs)
07:00
07:10

Labour (Hrs)
09:00
13:00

Travel From Customer (Hrs)
13:00
13:00

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

PMA Type		Smartcare		Smartcare Pro		Foscare Pro	

Details of Work / Test	
- test before 8m	
- Cleaning kit 800, 36 mo replace	
- Washing plastic pump	
- test operation	
- Distillation 80 - 80 ml	
- Distillation 6 min 180 - 120 ml	
- Alkali 80 - 80 ml	
- All pass	

Part No:	Batch	Description	Qty
60031810	08-01-2024	FOS PM KIT K1800 6200 36 mo	1

I confirm this report is accurate and complete

Signed FOS: [Signature]
Name: [Name]
Signed Customer: [Signature]
Name: [Name]

Email: [Email]
Customer Contact: [Customer Contact]
*Remark: [Remark]

Please scan QR code

Certificate of Calibration

Certificate No.: 250422-1-BL002-25

Code No.: BL002-25

Page: 1 of 3

Customer Name: United Analyst and Engineering Consultant Co., Ltd.
Address: 3 Soi Udom suk 41, Sukhumvit Rd., Bang Chak, Phrakhanong, Bangkok 10260

Equipment: Electronic Balance

Manufacturer: Mettler Toledo

Model: AB204-S/FACT

Serial No.: 1129361010

Asset No.: UAE.WAS.002/2552

Building: N/A

Room: 107

Received Date: April 22, 2025

Date of Calibration: April 23, 2025

Calibration Conditions: Temperature 22.8 °C to 23.4 °C

Humidity 54.8 % to 68.9 %

Pressure 756.6 mmHg to 758.2 mmHg

Calibrated by: Sakkarin Srirahang

Approved by: Suwit Chotnok

Issued Date: April 25, 2025

Note: 1) The Uncertainties are for a confidence probability of approximately 95%

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

3) This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the United Analyst and Engineering Consultant Co., Ltd. (UAE)

เอกสารไม่ควบคุม

Certificate No.: 250422-1-BL002-25

Code No.: BL002-25

Page: 2 of 3

Equipment: Electronic Balance

Model: AB204-S/FACT

Serial No.: 1129361010

Max. Capacity: 220 g

Calibration Date: April 23, 2025

Condition As-Received: In Condition

Manufacturer: Mettler Toledo

Readability: 0.0001 g

ID No.: UAE.WAS.002/2552

Condition of Equipment:

Condition of This Result of Calibration:

1. Calibration Method: This instrument was calibrated by method UAE CP CAL.006 In-House Method based on UKAS Lab 14 : 2022

2. Reference Standards:

Reference Standard:

Standard Weight Class E2 (OIML)

Standard Weight Class F1 (OIML)

Instrument

Thermo-Hygro-Baro Meter

Thermo-Hygro-Baro Meter

3. This certification is traceable to SI Unit

4. This certification is 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. Through the reference standard laboratory of AMARC 25-009359 Calibration 0152

Calibration Result:

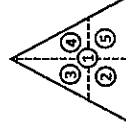
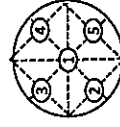
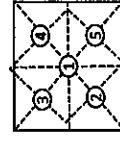
1. Repeatability of Reading:

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

2. Eccentric or off-center loading

A mass of 100 g was placed and moved to various positions on pan

The Balance reading obtained is given in the table.



1 (g)	2 (g)	3 (g)	4 (g)	5 (g)	Maximum Difference (g)
100.0000	99.9996	99.9997	100.0003	100.0005	0.0005

เอกสารไม่ควบคุม



ศูนย์บริการสอบเทียบมาตรฐาน
Foundation for Industrial Development National Food Institute
Food Industrial Laboratory Service Center
Ministry of Industry



REGISTRATION NO. 17025
CALIBRATION 0081

Calibration Certificate

Certificate No.: 2502229-002-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udonsuk 41, Sukhumvit Road,
Bangchack, Prakhonong, Bangkok 10260

Page 1 of 3

Equipment: CHAMBER (Incubator)

Manufacturer: MEMMERT

Model: IPP260

Serial No.: V616.0066

ID No.: UAE.MIC.032/2559

Order No.: 2502229

Operation No.: 2502229-002

Date of Receipt: 19 March 2025

Date of Calibration: 19 March 2025

Calibrated by: Mr.Yothin Charoensuk
Scientist

Approved by: J. Jangphairat
(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.

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

เอกสารนี้ควบคุมด้วย

0---o-End-o---o



UAE United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udonsuk 41, Sukhumvit Road, Bangchak, Prakhonong, Bangkok 10260
Tel.0 2763 2828 Fax.0 2763 2800 www.uaec consultant.com E-mail: uaec@uaec consultant.com

Certificate No.: 250422-1-81.002-25

Code No.: BL002-25

Page: 3 of 3

Equipment: Electronic Balance Manufacturer: Mettler Toledo
Model: AB204-S/FACT Readability: 0.0001 g
Serial No.: 1129361010 ID No.: UAE.WAS.002/2552

Max. Capacity: 220 g

Calibration Date: April 23, 2025

Calibration Result: (Continued)

Calibration Range: 0 - 200 g

Calibration Adjustment: Internal Calibration

3. Error of Indication from nominal or conventional mass value:

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty ($\pm$ mg)	Coverage Factor k
Unload	0.0000000	0.0000	0.0000	0.10	2.05
0.01	0.0100025	0.0099	0.0001	0.10	2.05
0.05	0.0500056	0.0500	0.0000	0.10	2.05
0.1	0.1000012	0.0999	0.0001	0.10	2.05
0.5	0.5000133	0.5000	0.0000	0.10	2.05
1	1.0000105	1.0000	0.0000	0.10	2.05
10	10.000010	10.0000	0.0000	0.11	2.04
40	40.000076	40.0000	0.0000	0.14	2.00
50	50.000056	50.0000	0.0001	0.13	2.00
80	80.000107	80.0000	0.0001	0.18	2.00
100	100.000109	99.9999	0.0002	0.17	2.00
120	120.000015	119.9999	0.0003	0.21	2.00
150	150.000165	149.9998	0.0003	0.24	2.00
160	160.000175	159.9997	0.0005	0.26	2.00
200	200.000129	199.9998	0.0004	0.30	2.00

4. Effect of Tare test:

Tare Load (g)	Test Load (g)	Indication (g)	Correction (g)
	20.000041	19.9999	0.0001
	40.000076	39.9998	0.0002
100	60.000066	59.9997	0.0003
	80.000107	79.9999	0.0002
	100.000168	100.0004	-0.0003

Remarks:

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

Calibration Report

Certificate No.: 2502229-002-01
Equipment: CHAMBER (Incubator)
Model: IPP260 **Serial No.:** V616.0066
Resolution: 0.1 °C **ID No.:** UAE.MTC.032/2559
Manufacturer: MEMMERT
Date of Calibration: 19 March 2025

Page 2 of 3

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

Environment Condition:
Ambient Temperature (21.7 ± 1) °C
Relative Humidity (59 ± 1) %
Line Voltage (223 ± 3) Volt

Condition of this results of Calibration:

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

Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY57003188	TE 670486-01	8 June 2025	NATIONAL FOOD INSTITUTE
	RTD	CH#201-209/ RTD#201-209			

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 25.0 and 36.0 °C
Fresh air Damper ☒ Open ☐ Close Position ☐ Fan ☐
Not Available ☒ Without adjustment ☐ After adjustment

7. Result of Calibration :


25 March 2025



Calibration Report

Certificate No.: 2502229-002-01
Equipment: CHAMBER (Incubator)
Model: IPP260 **Serial No.:** V616.0066
Resolution: 0.1 °C **ID No.:** UAE.MTC.032/2559
Manufacturer: MEMMERT
Date of Calibration: 19 March 2025

Page 3 of 3

Calibration point: 25.0 and 36.0 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	21.3	58	220.0
MAX	22.0	60	225.0

Table1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No.									Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
25.0	25.19	25.16	25.22	25.17	24.85	24.91	24.78	24.85	24.97	0.29
36.0	34.57	34.74	35.13	35.29	36.32	36.16	36.20	36.34	35.73	0.63

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
25.0	24.9	25.0	25.0	0.088	0.25	0.61
36.0	35.9	36.0	36.0	0.44	1.2	2.3

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

UUC* = Unit Under Calibration

Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors;

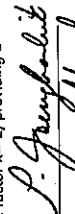
for at least half an hour after reaching steady state.

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

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

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

----- End -----


25 March 2025



Calibration Certificate

Certificate No.: 2503682-004-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road,
Bangchack, Prakanong, Bangkok 10260

Page 1 of 3

Equipment: CHAMBER (Incubator)

Manufacturer: BINDER

Model: KB 400

Serial No.: 2022000022479

ID No.: UAE.MIC.028/2566

Order No.: 2503682

Operation No.: 2503682-004

Date of Receipt: 1 July 2025

Date of Calibration: 1 July 2025

Calibrated by Mr.Pheraphat Tuanjit
Scientist
Approved by 
(Miss Preeyaporn Jaengkarnkit)
Vice President, Department of Laboratory Services
Responsible for the Technical Management Team

Date of Issue: 3 July 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.

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



Calibration Report

Certificate No.: 2503682-004-01
Equipment: CHAMBER (Incubator)
Model: KB 400
Serial No.: 2022000022479
Resolution: 0.1 °C
ID No.: UAE.MIC.028/2566
Manufacturer: BINDER
Date of Calibration: 1 July 2025

Page 2 of 3

Location: Microbiology Laboratory, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Environment Condition:
Ambient Temperature (21 ± 1) °C
Relative Humidity (55 ± 10) %
Line Voltage (230 ± 5) 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	MY59003377	2501168-001-01	13 January 2026	NATIONAL FOOD INSTITUTE
	RTD	CH#101-203 / RTD#101-203			

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 Calibration item : Good

UUC Description :

Time of Record 1 Hour 9 Minute At 35.0 °C

Fresh air Damper

Open Close Position Fan 100%

Not Available

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


3 July 2025

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



Calibration Report

Certificate No.: 2503682-004-01
Equipment: CHAMBER (Incubator)
Model: KB 400
Serial No.: 20220000022479
Resolution: 0.1 °C
ID No.: UAE.MTC.028/2566
Manufacturer: BINDER
Date of Calibration: 1 July 2025
Calibration point: 35.0 °C

Page 3 of 3

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	20.1	45	225.0
MAX	22.0	65	235.0

Table 1 : Reporting of Temperature

Calibration point	Measured Temperature (°C) @ Sensor No.													Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	
35.0	35.19	35.03	34.83	35.21	34.96	34.94	34.84	34.84	35.06	34.94	35.15	34.79	34.92	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			
34.8	34.8	34.8	34.8	0.040	0.29	0.50

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

UUC* = Unit Under Calibration

Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors,

for at least half an hour after reaching steady state.

Uniformity = The maximum difference of measured temperatures at any sensors and the measured

temperature at the reference location which are observed at the same time.

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

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor (k= 2, providing a

level of confidence of approximately 95 %.

P. Panyachit
13 July 2025



Certificate of Calibration

Cert.No.: 25CH1433
Page.: 1 of 3

Equipment : pH Meter
Manufacturer : Horiba
Model : LAQUA-PH210
Serial No. : HA0A0005
ID No. : UAE.EFM.004/2563(EFM,pH.04/63)
Condition As-Received:
Received Date : 09 December 2025
Calibration Date : 11 December 2025
Reference : 2512-0243WSC-2
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road, Bangchak,
Phrahanong, Bangkok 10260
Ambient Temperature : (25 ± 2.5) °C
Relative Humidity : (50 ± 15) %
Calibration Procedure : In - house method :
- CP-CH5 by direct measurement with DC voltage standard and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with temperature standard

Calibrated by : Warakom Lemgagrakul .

Approved by :
Approved Signatory

(✓) Chakrit Waewwanjua
() Ponpan Paipim
() Saitip Meangmai

Issue Date : 12 December 2025

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

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Cert.No.: 25CH1433
Page.: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	25E2743	25 Aug 2026
2) Ref. Standard Thermometer	4982054	110RC044	25I708	03 July 2026

- This measurement result is traceable to SI through Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials :The measurement results are traceable to SI through Hach Lange GmbH Ltd.,
Deutsche Akkreditierungsstelle, Accredited No.D-RM-15184-01-00
:The measurement results are traceable to SI through CPA chem Ltd.,
ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.007	CPA chem	1114384	12 June 2027
pH 6.999	Hach Lange GmbH	C03273	13 May 2027
pH 10.010	CPA chem	1114385	08 June 2026

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

Calibration Results

Function : mV Measurement

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

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (mV)	Coverage factor k
			mV	pH		
pH Meter S/N.: HA0A0005	4.00	177.48	177.4	4.01	0.058	2.00
	7.00	0.00	0.1	7.00	0.058	2.00
	10.00	0.00	0.1	7.00	0.058	2.00



Cert.No.: 25CH1433
Page.: 3 of 3

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7)(7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor k
pH Electrode S/N.: -	4.007	4.01	175.4	0.0085	2.00
	6.999	7.00	-0.3	0.0095	2.00
	6.999	7.01	-0.5	0.0096	2.00
	10.010	10.01	-170.6	0.0092	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model :
- Serial No. :

Dimension of probe

- Length : 112 mm.

- Diameter : 16 mm.

- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
15.0	15.002	15.0	-0.002	0.13	2.00
30.0	30.002	30.0	-0.002	0.13	2.00
45.0	45.003	45.0	-0.003	0.13	2.00

Remark : - UUC* = Unit Under Calibration

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

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เอกสารไม่ควบคุม

เอกสารไม่ควบคุม

แบบบันทึกผลการทดสอบเตาย่อย (Heating Block/Digestion Unit)

รายละเอียดเครื่องมือที่ใช้ทดสอบ : หมายเลขประจำเครื่อง : 01349.0000
 ชื่อ : Foss Tecator
 รุ่น : 0500 0000
 หมายเลขใบสอบเทียบ : 11000571-001-01 วันที่สอบเทียบ : 13/11/18
 รายละเอียดเครื่องมือที่ใช้ทดสอบ (Reference Standard) : สถานะที่ทดสอบ :
 เครื่องมือ : 01349.0000 ชื่อ :
 หมายเลขเครื่อง : 11000571-001-01 รุ่น : DP-51 อุณหภูมิ :
 หมายเลขประจำเครื่อง : 01349.0000 ความชื้นสัมพัทธ์ :
 หมายเลขเครื่อง (Probe) : 01349.0000
 หมายเลขใบสอบเทียบ : 11000571-001-01 วันที่สอบเทียบ : 13/11/18
 หมายเลขสอบเทียบ : 11000571-001-01

ผลการทดสอบเตาย่อย Calibration Point 380 °C

เตาย่อยหม้อที่ Calibration Point 380 °C Setting Point 380 °C	อุณหภูมิที่อ่านได้จากเตาย่อย (°C)				อุณหภูมิที่อ่านได้จาก Reference Standard (°C)			
	Digester Unit				UAE - WRS 005 / 1553 ; Thermocouple			
	ครั้งที่ 1	ครั้งที่ 2	ค่าเฉลี่ย	คิดค่าแก้ไขแล้ว	ครั้งที่ 1	ครั้งที่ 2	ค่าเฉลี่ย	คิดค่าแก้ไขแล้ว
A1	380	380	380	-	379.6	379.3	379.5	379.5
A2	381	381	381	-	380.7	380.3	380.5	380.5
A3	381	380	380.5	-	380.0	380.6	380.4	380.4
A4	381	381	381	-	381.4	381.7	381.6	381.6
B1	381	381	381	-	381.9	380.9	381.4	381.4
B2	380	381	380.5	-	380.6	379.8	380.2	380.2
B3	380	381	380.5	-	380.8	380.1	380.5	380.5
B4	381	381	381	-	380.7	381.9	381.3	381.3
C1	380	380	380	-	380.1	380.6	380.4	380.4
C2	380	381	380.5	-	379.7	379.3	379.5	379.5
C3	380	380	380	-	380.5	380.0	380.3	380.3
C4	381	380	380.5	-	380.7	381.3	381.0	381.0

หมายเหตุ : เก็บใบเพิ่ม WRS 0-05

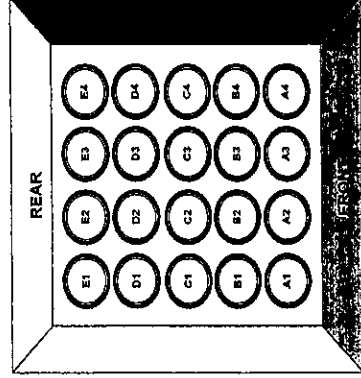
1/2

เอกสารไม่ควบคุม

ผลการทดสอบ (ต่อ)

เตาย่อยหม้อที่ Calibration Point 380 °C Setting Point 380 °C	อุณหภูมิที่อ่านได้จากเตาย่อย (°C)				อุณหภูมิที่อ่านได้จาก Reference Standard (°C)			
	Digester Unit				UAE - WRS 005 / 1553 ; Thermocouple			
	ครั้งที่ 1	ครั้งที่ 2	ค่าเฉลี่ย	คิดค่าแก้ไขแล้ว	ครั้งที่ 1	ครั้งที่ 2	ค่าเฉลี่ย	คิดค่าแก้ไขแล้ว
D1	380	381	380.5	-	380.8	381.3	381.1	381.1
D2	380	381	380.5	-	381.3	381.7	381.5	381.5
D3	381	381	381	-	381.9	381.5	381.7	381.7
D4	381	380	380.5	-	380.6	380.9	380.8	380.8
E1	381	381	381	-	381.4	380.8	381.1	381.1
E2	381	381	381	-	380.7	381.1	380.9	380.9
E3	380	381	380.5	-	382.1	382.9	382.5	382.5
E4	381	380	380.5	-	380.1	379.5	379.8	379.8
ค่าเฉลี่ย	-	-	-	-	-	-	-	-
ค่าส่วนเบี่ยงเบนมาตรฐาน	-	-	-	-	-	-	-	-
ค่าความผิดพลาด	-	-	-	-	-	-	-	-
เกณฑ์การยอมรับ	-	-	-	-	-	-	-	-
ผลการทดสอบ	380 ± 5 °C							

พิจารณาค่าความผิดพลาดแต่ละจุดให้อยู่ในช่วงเกณฑ์การยอมรับ



ผู้บันทึก : 01349.0000
 วันที่ : 13/11/18

ผู้ตรวจสอบ : 05/11/18
 วันที่ : 05/11/18

2/2

เอกสารไม่ควบคุม

หมายเหตุ : เก็บใบเพิ่ม WRS 0-05

List of Instruments Certification for Air Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
Ambient									
1	Standard Gases (Mixture)	Nitrogen Dioxide Sulphur Dioxide Carbon Monoxide	Airgas	EB0159156 2015PSIG	Airgas an Air Liquide company	E04N99E15A01D3	6 Nov 23	6 Nov 26	-
2	Standard Gas	Total Hydrocarbons	Air Liquide	CC143232	Airgas an Air Liquide company	E03A99E15A006C	16 Oct 20	16 Oct 28	-
3	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Scientific	42i CM22387040	UAE Consultant Co.,Ltd.	20092024	20 Sep 24	6 Nov 26	-
5	Sulphur Dioxide Analyzer	Sulphur Dioxide	Thermo Scientific	43i 1180540065	UAE Consultant Co.,Ltd.	4092024	4 Sep 24	6 Nov 26	-
6	Carbon Monoxide Analyzer	Carbon Monoxide	Thermo	48C 48C-62494-335-5	UAE Consultant Co.,Ltd.	03092024	3 Sep 24	6 Nov 26	-
7	Total Hydrocarbons Analyzer	Total Hydrocarbons	Thermo Scientific	APHA-370 93JN1M1N9	UAE Consultant Co.,Ltd.	2092024	2 Sep 24	4 Aug 28	-
Water									
8	pH Meter	pH	Horiba	LAQUA-PH210 HA9M0046	Technology Promotion Association (Thailand-Japan)	25CH1432	11 Dec 25	10 Dec 26	-

CERTIFICATE OF ANALYSIS
Grade of Product: EPA PROTOCOL STANDARD

Customer: AIR LIQUIDE
(THAILAND) LTD
Part Number: E04N199E15A01D3
Cylinder Number: 122-402880224-1
Laboratory: EB0159156
PGVP Number: 124 - Durham (SAP) - NC
Valve Outlet: 660
Gas Code: CO, NO, NOX, SO2, BALN
Reference Number: 122-402880224-1
Cylinder Volume: 144.0 CF
Cylinder Pressure: 2015 PSIG
Valve Outlet: 660
Certification Date: Nov 06, 2023
Expiration Date: Nov 06, 2026

Certification performed in accordance with EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012) document EPA 800R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. This report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NOX	45.00 PPM	46.78 PPM	G1	+/- 1.3% NIST Traceable
NITRIC OXIDE	45.00 PPM	46.77 PPM	G1	+/- 1.3% NIST Traceable
SULFUR DIOXIDE	45.00 PPM	42.89 PPM	G1	+/- 1.0% NIST Traceable
CARBON MONOXIDE	1000 PPM	965.9 PPM	G1	+/- 0.7% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	21080703	CC707954	48.41 PPM NITRIC OXIDE/NITROGEN	+/- 1.2%	Sep 21, 2025
PRM	D913660		15.01 PPM NITROGEN DIOXIDE/AIR	+/- 1.5%	Feb 18, 2023
GMIS	124208889	CC322689	4.573 PPM NITROGEN DIOXIDE/NITROGEN	+/- 1.6%	Feb 17, 2026
NTRM	19051005	CC473180	49.02 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Mar 22, 2028
NTRM	14080154	CC438951	990.9 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	Nov 15, 2025

The SRM, NTRM, PRM, or RGM noted above is only in reference to the GLIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet iS50 AUP2010249 CO	FTIR	Oct 11, 2023
Nicolet iS50 AUP2010249 NO	FTIR	Oct 11, 2023
Nicolet iS50 AUP2010249 NO2	FTIR	Oct 11, 2023

Triad Data Available Upon Request

NOTES: GROSS WEIGHT: 28.4 kg

NET WEIGHT: 4.7 kg



Signature on file

Approved for Release

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number: E03A199E15A008C
Cylinder Number: CC143232
Laboratory: 124 - Plymouthville - PA
PGVP Number: A12020
Gas Code: CH4, PPN, BALA
Reference Number: 160-401908379-1
Cylinder Volume: 144.0 CF
Cylinder Pressure: 2016 PSIG
Valve Outlet: 590
Certification Date: Oct 16, 2020
Expiration Date: Oct 16, 2023

Certification performed in accordance with EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012) document EPA 800R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
METHANE	4000 PPM	4019 PPM	G1	+/- 1.0% NIST Traceable
PROPANE	4000 PPM	4003 PPM	G1	+/- 0.7% NIST Traceable
AIR	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	02010405	K010860	4878 PPM PROPANE/NITROGEN	+/- 0.6%	Dec 02, 2021
NTRM	170803	CC160280	0.997 % METHANE/NITROGEN	+/- 0.4%	Aug 22, 2023

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
MKS FTIR - CH4 - 000828701	FTIR	Oct 14, 2020
Nicolet 6700 APV100391 C3H8	FTIR	Sep 18, 2020

Triad Data Available Upon Request

NOTES: NET WEIGHTS: 4.865kg

GROSS WEIGHTS: 27.385kg

PO#: 5220003825



Approved for Release

Certificate of Calibration

Certificate No.: 250422-1-BL002-25

Code No.: BL002-25

Page: 1 of 3

Customer Name: United Analyst and Engineering Consultant Co., Ltd.
Address: 3 Soi Udom suk 41, Sukhumvit Rd., Bang Chak, Phrakhanong, Bangkok 10260

Equipment: Electronic Balance
Manufacturer: Mettler Toledo
Model: AB204-S/FACT
Serial No.: 1129361010
Asset No.: UAE.WAS.002/2552
Building: N/A

Floor: 1 **Room:** 107

Received Date: April 22, 2025
Date of Calibration: April 23, 2025
Calibration Conditions:
Temperature 22.8 °C to 23.4 °C
Humidity 54.8 % to 68.9 %
Pressure 756.6 mmHg to 758.2 mmHg

Calibrated by: Sakkarin Sirirahang
Approved by: Suwit Chotnok
Signature: 

Issued Date: April 25, 2025

Note: 1) The Uncertainties are for a confidence probability of approximately 95%

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

3) This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the United Analyst and Engineering Consultant Co., Ltd. (UAE)

เอกสารไม่ควบคุม

Certificate No.: 250422-1-BL002-25

Code No.: BL002-25

Page: 2 of 3

Equipment: Electronic Balance
Model: AB204-S/FACT
Serial No.: 1129361010
Max. Capacity: 220 g
Calibration Date: April 23, 2025
Condition As-Received: In Condition
Manufacturer: Mettler Toledo
Readability: 0.0001 g
ID No.: UAE.WAS.002/2552

Condition of Equipment:

Condition of This Result of Calibration:

1. Calibration Method: This instrument was calibrated by method UAE.CP.CAL.006 In-House Method based on UKAS Lab 14 : 2022

Reference Standards:

Reference Standard:	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Standard Weight Class E2 (OIML)	1 mg to 1 kg	B749109122	AMARC	25-009359	Mettler-Toledo	21-Jan-27
Standard Weight Class F1 (OIML)	1 mg to 200 g	11119512	AMARC	24-013640	Mettler-Toledo	04-Feb-26
Instrument	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Thermo-Hygro-Baro Meter	MHB-3825D	AK-66457	SUCCESS	SG-H-00997/67	Success Gateway	21-Nov-25
Thermo-Hygro-Baro Meter	MHB-3825D	AK-66457	TPA	259795	TPA	25-Feb-26

3. This certification is traceable to SI Unit

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

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

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

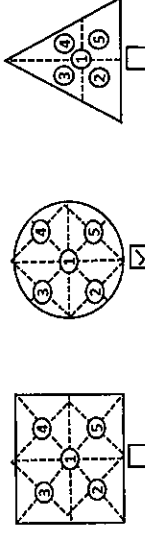
Calibration Result:

1. Repeatability of Reading:	Nominal Value (g)	Standard Deviation of Reading (g)
	200*	0.000045

2. Eccentric or off-center loading

A mass of 100 g was placed and moved to various positions on pan

The Balance reading obtained is given in the table.



1 (g)	2 (g)	3 (g)	4 (g)	5 (g)	Maximum Difference (g)
100.0000	99.9996	99.9997	100.0003	100.0005	0.0005

เอกสารไม่ควบคุม

Certificate No.: 250422-1-BL002-25

Code No.: BL002-25

Page: 3 of 3

Equipment: Electronic Balance Manufacturer: Mettler Toledo
 Model: AB204 S/FACT Readability: 0.0001 g
 Serial No.: 1129361010 ID No.: UAE.WAS.002/2552
 Max. Capacity: 220 g
 Calibration Date: April 23, 2025

Calibration Result: (Continued)

Calibration Range: 0 - 200 g

Calibration Adjustment: Internal Calibration

3. Error of indication from nominal or conventional mass value:

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty (± mg)	Coverage Factor k
Unload	0.0000000	0.0000	0.0000	0.10	2.05
0.01	0.0100025	0.0099	0.0001	0.10	2.05
0.05	0.0500056	0.0500	0.0000	0.10	2.05
0.1	0.1000012	0.0999	0.0001	0.10	2.05
0.5	0.5000133	0.5000	0.0000	0.10	2.05
1	1.0000105	1.0000	0.0000	0.10	2.05
10	10.000010	10.0000	0.0000	0.11	2.04
40	40.000076	40.0000	0.0000	0.14	2.00
50	50.000056	50.0000	0.0001	0.13	2.00
80	80.000107	80.0000	0.0001	0.18	2.00
100	100.000109	99.9999	0.0002	0.17	2.00
120	120.00015	119.9999	0.0003	0.21	2.00
150	150.000165	149.9998	0.0003	0.24	2.00
160	160.000175	159.9997	0.0005	0.26	2.00
200	200.000129	199.9998	0.0004	0.30	2.00

4. Effect of Tare test:

Tare Load (g)	Test Load (g)	Indication (g)	Correction (g)
100	20.000041	19.9999	0.0001
	40.000076	39.9998	0.0002
	60.000066	59.9997	0.0003
	80.000107	79.9999	0.0002
	100.000168	100.0004	-0.0003

Remark:

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k, providing

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ขอสงวนสิทธิ์ใน
 เลขที่ใบตรวจวัด 25



Certificate No. 260318-1-BL007-26
Code No.: BL007-26
Page: 2 of 3

Equipment: Electronic Balance
Model: AB204-S/FACT
Serial No.: 1129361010
Max. Capacity: 220 g
Calibration Date: April 3, 2026
Condition As-Received: In Condition

Manufacturer: Mettler Toledo
Readability: 0.0001 g
ID No.: UAE.WAS.002/2552

Condition of Equipment:

Condition of This Result of Calibration:

1. Calibration Method: This instrument was calibrated by method UAE CP-04.006 In-House Method based on NWS Lab 14: 2022

2. Reference Standards:

Reference Standard: Model Serial No. Certificate No.
Standard Weight Class E2 (OIML) 1 mg to 1 kg C510641605 METTLER TOLEDO GmbH C510641605

Traceability: Mettler-Toledo
Due Date: 3-Mar-27

Instrument

Thermo-Hygro Baro Meter Model Serial No. Certificate No.
MH8-362SD AK46457 SG-H 00992/68
MH8-362SD AK46457 TPA 2594064

3. This certification is traceable to SI Unit

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

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

6. Through the reference standard laboratory of Mettler-Toledo GmbH C510641605, SAS accreditation number SGS 0032

Calibration Result:

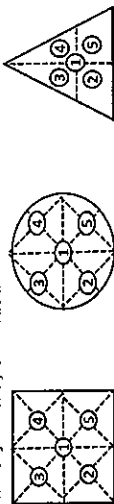
1. Repeatability of Reading:

Nominal Value (g)	Standard Deviation of Reading (g)
200*	0.00010

2. Eccentric or off-center loading

A mass of 100 g was placed and moved to various position on pan.

The Balance reading obtained is given in the table.



1 (g)	2 (g)	3 (g)	4 (g)	5 (g)	Maximum Difference (g)
100.0025	100.0022	100.0022	100.0029	100.0030	0.0005

Note : 1) The Uncertainties are for a confidence probability of approximately 95%

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

3) This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory

Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the

United Analyst and Engineering Consultant Co.,Ltd. (UAE)

เอกสารไม่ควบคุม



Certificate of Calibration

Certificate No.: 260318-1-BL007-26
Code No.: BL007-26
Page: 1 of 3

Customer Name: United Analyst and Engineering Consultant Co., Ltd.
Address: 3 Soi Udomsuk 41, Sukhumvit Rd., Bang Chak, Phrakhanong, Bangkok 10260

Equipment: Electronic Balance

Manufacturer: Mettler Toledo

Model: AB204-S/FACT

Serial No.: 1129361010

Asset No.: UAE.WAS.002/2552

Building : UAE No.3

Floor : 1

Room : 107

Received Date: April 2, 2026

Date of Calibration : April 3, 2026

Calibration Conditions: Temperature start 21.9 °C end 22.1 °C

Humidity start 60.6 % end 60.1 %

Pressure start 756.6 mmHg end 755.1 mmHg

Calibrated by: Thanachat Chatpahal

Approved by: Suwit Chotnok

Signature:

Chit

Issued Date: April 7, 2026

เอกสารไม่ควบคุม

Equipment:	Electronic Balance	Manufacturer:	Mettler Toledo
Model:	AB204-S/FACT	Readability:	0.0001 g
Serial No.:	1129361010	ID No.:	UAE-WAS-002/2552
Max. Capacity:	220 g		
Calibration Date:	April 3, 2026		

Calibration Result: (Continued)

Calibration Range: 0 - 200 g

Calibration Adjustments: Internal Calibration

3. Error of Indication from nominal or conventional mass value:

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty (± mg)	Coverage Factor k
Unload	0.0000000	0.0000	0.0000	0.17	2.37
0.01	0.0100005	0.0099	0.0001	0.17	2.32
0.05	0.0500003	0.0499	0.0001	0.17	2.32
0.1	0.1000083	0.0999	0.0001	0.17	2.32
0.5	0.5000121	0.5000	0.0000	0.17	2.32
1.0	1.0000119	1.0000	0.0000	0.17	2.32
10.0	10.000033	10.0003	-0.0003	0.17	2.32
40.0	40.000054	40.0010	-0.0010	0.18	2.23
50.0	50.000037	50.0013	-0.0012	0.18	2.23
80.0	80.000098	80.0020	-0.0019	0.19	2.11
100.0	100.000042	100.0025	-0.0024	0.20	2.10
120.0	120.000068	120.0028	-0.0027	0.22	2.06
150.0	150.000079	150.0035	-0.0035	0.24	2.04
160.0	160.000112	160.0036	-0.0035	0.25	2.03
200.0	200.000146	200.0049	-0.0047	0.28	2.00

4. Effect of Tare test:

Tare Load (g)	Test Load (g)	Indication (g)	Correction (g)
100	20.000028	20.0004	-0.0003
	40.000054	40.0009	-0.0008
	60.000070	60.0013	-0.0012
	80.000098	80.0017	-0.0016
	100.000042	100.0021	-0.0021

Remark:-

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

Calibration Certificate

Certificate No.: 2502226-002-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road,
Bangchack, Prakhonong, Bangkok 10260

Page 1 of 4

Equipment: Electronic Balance

Manufacturer: METTLER TOLEDO

Model: XSR205DU

Serial No.: C210685394

ID No.: UAE.WAO.010/2565

Order No.: 2502226

Operation No.: 2502226-002

Date of Receipt: 19 March 2025

Date of Calibration: 20 March 2025

Calibrated by Mr.Yothin Charoensuk
Scientist

Date of Issue: 25 March 2025

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

The uncertainties are for a confidence probability of approximately 95%

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

FCS-009 Revision-01 Date: 20.04.65



Calibration Report

Certificate No.: 2502226-002-01
Equipment: Electronic Balance
Manufacturer: METTLER TOLEDO
Model: XSR205DU
Resolution: 0.0001 g / 0.0001 g
Serial No.: C210685394
ID No.: UAE.WAO.010/2565
Capacity: 82 g / 220 g

Page 2 of 4

Date of Calibration: 20 March 2025
Environment Condition: Ambient Temperature: 21.2 ± 0.6 °C Relative Humidity: 48 ± 3.5 %

Place of Calibration: 208 Balance Room, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Condition of Equipment: Good Condition

Condition of This Results of Calibration:

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

2. Reference Standards:

Reference Standard	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Standard Weight Class E2	1mg to 200g	B905567572	TCS	M24041005	19 April 2025
Instrument	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Thermo-Hygro Meter	608-H1	NFLBTH 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:

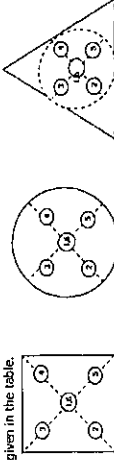
1. Repeatability of Reading:

Nominal Value (g)	Standard Deviation of Reading (g)
40	0.0000042
80	0.0000042
100	0.000000
200	0.000000

2. Off-Center Error:

A mass of 100 g was placed and moved to various position on pan.

The balance reading obtained is given in the table.



	1	2	3	4	5	6	(Maximum Difference)
(g)	100.0001	100.0001	100.0001	100.0001	100.0001	100.0001	(g)
	100.0001	100.0001	100.0001	100.0001	100.0001	100.0001	0.0000

for N. Nigubet

FCS-012 Revision-01 Date: 20.04.65



Calibration Report

Certificate No.: 2502226-002-01

Equipment:

Electronic Balance

Manufacturer: METTLER TOLEDO

Model: XSR205DU

Resolution: 0.00001 g / 0.0001 g

Serial No.: C210685394

ID No.: UAEWAO.01072565

Capacity: 82 g / 220 g

Date of Calibration: 20 March 2025

Page 3 of 4

Calibration Results: (Continued)

Calibration Range: 0-80 g

Calibration Adjustment: Internal Calibration

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

Nominal Value (g)	Standard Value (g)	Average Reading (g)	Correction (g)	Uncertainty (± g)	Coverage Factor k
Uncal	0.00000	0.00000	0.00000	0.000087	2.00
0.001	0.001003	0.00100	0.00000	0.0000090	2.00
0.005	0.005002	0.00501	-0.00001	0.0000092	2.00
0.01	0.010003	0.01002	-0.00002	0.0000089	2.00
0.05	0.049996	0.05001	-0.00001	0.0000096	2.00
0.1	0.100011	0.10002	-0.00001	0.000011	2.00
0.5	0.500016	0.50004	-0.00002	0.000014	2.00
1	1.000003	1.00005	-0.00005	0.000016	2.00
2	2.000023	2.00006	-0.00004	0.000017	2.00
5	5.000015	5.00006	-0.00005	0.000020	2.00
10	10.000009	10.00005	-0.00004	0.000026	2.00
20	20.000030	20.00007	-0.00004	0.000037	2.00
30	30.000039	30.00009	-0.00005	0.000050	2.00
50	50.000028	50.00008	-0.00005	0.000068	2.00
80	80.000067	80.00013	-0.00006	0.00011	2.00

for N. Nijmabont

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



Calibration Report

Certificate No.: 2502226-002-01

Equipment:

Electronic Balance

Manufacturer: METTLER TOLEDO

Model: XSR205DU

Resolution: 0.00001 g / 0.0001 g

Serial No.: C210685394

ID No.: UAEWAO.01072565

Capacity: 82 g / 220 g

Date of Calibration: 20 March 2025

Page 4 of 4

Calibration Results: (Continued)

Calibration Range: >80-200 g

Calibration Adjustment: Internal Calibration

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

Nominal Value (g)	Standard Value (g)	Average Reading (g)	Correction (g)	Uncertainty (± g)	Coverage Factor k
90	90.00010	90.0002	-0.0001	0.00015	2.00
100	100.00006	100.0001	0.0000	0.00016	2.00
110	110.00007	110.0002	-0.0001	0.00017	2.00
120	120.00009	120.0002	-0.0001	0.00018	2.00
130	130.00010	130.0002	-0.0001	0.00019	2.00
140	140.00013	140.0002	-0.0001	0.00019	2.00
150	150.00009	150.0002	-0.0001	0.00021	2.00
160	160.00010	160.0002	-0.0001	0.00022	2.00
170	170.00012	170.0002	-0.0001	0.00023	2.00
200	200.00013	200.0002	-0.0001	0.00028	2.00

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

End

for N. Nijmabont

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





UAE United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsuk 41, Sukhumvit Road, Bangkok, Phrakhanong, Bangkok 10260
Tel.0 2763 2828 Fax 0 2763 2800 www.uaiconsultant.com E-mail: uae@uaiconsultant.com

Certificate of Calibration

Certificate No.: 260311-2-BL001-26

Code No.: BL001-26

Page: 1 of 4

Customer Name: United Analyst and Engineering Consultant Co., Ltd.
Address: 3 Soi Udom suk 41, Sukhumvit Rd., Bang Chak, Phrakhanong, Bangkok 10260

Equipment: Electronic Balance
Manufacturer: Mettler Toledo
Model: XSR205DU
Serial No.: C210685394
Asset No.: UAE.WAQ.010/2565
Building : UAE number 3
Floor : 2
Room : 208

Received Date: March 11, 2026
Date of Calibration : March 12, 2026
Calibration Conditions: Temperature 23.0 °C to 23.6 °C
Humidity 51.5 % to 54.4 %
Pressure 755.7 mmHg to 757.9 mmHg

Calibrated by: Thanachat Chatpahol
Approved by: Suwit Chotnok
Issued Date: March 16, 2026
Signature: *C. Chat*

Note : 1) The Uncertainties are for a confidence probability of approximately 95%
2) This Certificate is valid only to the item calibrated on date and place of calibration.
3) This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the United Analyst and Engineering Consultant Co., Ltd. (UAE)

เอกสารไม่ควบคุม



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Tel.0 2763 2828 Fax 0 2763 2800 www.uaiconsultant.com E-mail: uae@uaiconsultant.com

Certificate No.: 260311-2-BL001-26

Code No.: BL001-26

Page: 2 of 4

Equipment: Electronic Balance
Manufacturer: Mettler Toledo
Model: XSR205DU
Serial No.: C210685394
Max. Capacity: 81 g / 220 g
Calibration Date: March 12, 2026
Condition As-received: In Condition

Condition of Equipment:

Condition of This Result of Calibration:

1. Calibration Method: This instrument was calibrated by method UAE-CP-CAL-005 In-House Method issued on UAPS Lab 14, 2022

Reference Standards:

Reference Standard:	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Standard Weight Class E2 (OIML)	1 mg to 1 kg	C510641605	METTLER TOLEDO GmbH	C510641605	METTLER TOLEDO GmbH	3-Mar-27
Standard Weight Class E2 (OIML)	1 mg to 1 kg	8749109122	AJAPAC	25-09359	AJAPAC	21-Jan-27

Instrument

Instrument	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Thermo-Hygro-Baro Meter	MHB-382SD	AK-46457	SUCCESS	SG-H-0092/68	Success Gateway	26-Nov-26
Thermo-Hygro-Baro Meter	MHB-382SD	AK-46457	TPA	25P4464	TPA	19-Dec-26

3. This certification is traceable to SI Unit

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

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

6. Through the reference standard laboratory of Mettler-Toledo GmbH C510641605, SAS accreditation number SCS 0032

7. Through the reference standard laboratory of AJAPAC 25-09359, TIS accreditation number 0152

Calibration Results:

1. Repeatability of Reading:	
Nominal Value (g)	Standard Deviation of Reading (g)
80	0.000019
200*	0.000055

2. Eccentric or off-center loading

A mass of 100 g was placed and moved to various positions on pan
The balance reading obtained is given in the table.

1		2		3		4		5		Maximum Difference (g)	
(g)		(g)		(g)		(g)		(g)		(g)	
100.0002		100.0002		100.0003		100.0004		100.0003		0.0001	

C. Chat
เอกสารไม่ควบคุม



UAE United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsuk 41, Sukhumvit Road, Bangkok, Phrakhanong, Bangkok 10260
Tel: 0 2763 2828 Fax: 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com

MS-105-TIS 17025
CALIBRATION #116

Certificate No.: 260311-2-BL001-26

Code No.: BL001-26

Page: 3 of 4

Equipment: Electronic Balance Manufacturer: Mettler Toledo
Model: XSR205DU 0 to 81 (g): 0.01 mg, > 80 to 200 (g): 0.1 mg
Serial No.: C210685394 ID No.: UAE.WAO.0107555
Max. Capacity: 81 g / 220 g
Calibration Date: March 12, 2026

Calibration Result: (Continued)

Calibration Range: 0 to 80 (g)

Calibration Adjustment: Internal Calibration

3. Error of indication from nominal or conventional mass value: (Range: 0 to 81 (g); Resolution: 0.00001 g)

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty (± mg)	Coverage Factor k
Unloaded	0.0000000	0.00000	0.00000	0.032	2.65
0.001	0.0010020	0.00101	0.00000	0.032	2.65
0.005	0.0050025	0.00501	-0.00001	0.032	2.65
0.01	0.0100005	0.01001	-0.00001	0.032	2.65
0.05	0.0500003	0.05001	-0.00001	0.032	2.65
0.10	0.1000083	0.10000	0.00001	0.033	2.65
0.50	0.5000121	0.50001	0.00000	0.033	2.65
1	1.0000119	1.00003	-0.00002	0.032	2.52
2	2.0000125	2.00003	-0.00002	0.033	2.52
5	5.0000146	5.00003	-0.00002	0.033	2.32
10	10.0000330	10.00006	-0.00003	0.034	2.21
20	20.0000028	20.00006	-0.00003	0.041	2.07
30	30.0000661	30.00017	-0.00011	0.055	2.00
40	40.0000054	40.00021	-0.00016	0.066	2.00
50	50.0000337	50.00023	-0.00019	0.068	2.00
60	60.0000070	60.00029	-0.00022	0.084	2.00
80	80.0000098	80.00039	-0.00030	0.12	2.00

E. Lark

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MS-105-TIS 17025
CALIBRATION #116

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MS-105-TIS 17025
CALIBRATION #116

Certificate No.: 260311-2-BL001-26

Code No.: BL001-26

Page: 4 of 4

Equipment: Electronic Balance Manufacturer: Mettler Toledo
Model: XSR205DU 0 to 81 (g): 0.01 mg, > 80 to 200 (g): 0.1 mg
Serial No.: C210685394 ID No.: UAE.WAO.0107555
Max. Capacity: 81 g / 220 g
Calibration Date: March 12, 2026

Calibration Result: (Continued)

Calibration Range: > 81 to 200 (g)

Calibration Adjustment: Internal Calibration

3. Error of indication from nominal or conventional mass value: (Range: > 81 - 220 (g); Resolution: 0.0001 g)

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty (± mg)	Coverage Factor k
Unloaded	0.0000000	0.0000	0.0000	0.032	2.65
90	90.0000910	90.0004	-0.0003	0.16	2.00
100	100.0000420	100.0003	-0.0003	0.16	2.00
110	110.0000750	110.0004	-0.0003	0.18	2.00
120	120.0000680	120.0004	-0.0003	0.19	2.00
130	130.0001010	130.0005	-0.0004	0.20	2.00
140	140.0000960	140.0004	-0.0003	0.21	2.00
150	150.0000790	150.0005	-0.0004	0.22	2.00
160	160.0001120	160.0004	-0.0003	0.23	2.00
170	170.0001050	170.0003	-0.0002	0.24	2.00
200	200.0001460	200.0001	0.0000	0.26	2.00

4. Effect of Tare test:

Tare Load (g)	Test Load (g)	Indication (g)	Correction (g)
100	20.000028	20.0001	0.0000
	40.000054	40.0001	0.0000
	60.000070	60.0000	0.0001
	80.000098	80.0000	0.0001
	100.000109	100.0000	0.0001

Remark:--

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

o---o-End-o---

E. Lark

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Calibration Certificate

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

Page 1 of 4

Equipment: Electronic Balance
Manufacturer: METTLER TOLEDO
Model: XSR205DU
Serial No.: C009071872
ID No.: UAE.WAO.012/2563
Order No.: 2502226
Operation No.: 2502226-001
Date of Receipt: 19 March 2025
Date of Calibration: 20 March 2025

Calibrated by Mr.Yothin Charoensuk
Scientist
Date of Issue: 25 March 2025
Approved by *for N. Nigumbat*
(Mr.Pheraphat Tuanjit)
Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team

The uncertainties are for a confidence probability of approximately 95%

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

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



Calibration Report

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

Page 2 of 4

Date of Calibration: 20 March 2025
Environment Condition: Ambient Temperature: 21.2 ± 0.6 °C Relative Humidity: 48 ± 3.5 %

Place of Calibration: 208 Balance Room, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Condition of Equipment: Good Condition

Condition of This Results of Calibration:

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

2. Reference Standards:

Reference Standard Model Serial No. Calibrated By Certificate No. Due Date
Standard Weight Class E2 1mg to 200g 8505567572 TCS M24041005 19 April 2025

Instrument Model Serial No. Calibrated By Certificate No. Due Date
Thermo-Hygro Meter 608-H1 NFI.LTH 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)
40	0.0000052
80	0.0000042
100	0.0000000
200	0.0000000

2. Off-Center Error:

A mass of 100 g was placed and moved to various position on pan.

The balance reading obtained is given in the table.

1	2	3	4	5	6	(Maximum Difference)
(g)	(g)	(g)	(g)	(g)	(g)	(g)
100.0001	100.0001	100.0001	100.0001	100.0001	100.0002	0.0001

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



Calibration Report

Certificate No.: 2502226-001-01

Equipment:

Electronic Balance

Manufacturer: METTLER TOLEDO

Resolution: 0.0001 g / 0.0001 g

Model: XSR205DU

ID No.: UAE.WAO.012/2563

Serial No.: C099071872

Capacity: 82 g / 220 g

Date of Calibration: 20 March 2025

Page 3 of 4

Calibration Results: (Continued)

Calibration Range: 0-80 g

Calibration Adjustment: Internal Calibration

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

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

for N. Nigubak

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



Calibration Report

Certificate No.: 2502226-001-01

Equipment:

Electronic Balance

Manufacturer: METTLER TOLEDO

Resolution: 0.0001 g / 0.0001 g

Model: XSR205DU

ID No.: UAE.WAO.012/2563

Serial No.: C099071872

Capacity: 82 g / 220 g

Date of Calibration: 20 March 2025

Page 4 of 4

Calibration Results: (Continued)

Calibration Range: >80-200 g

Calibration Adjustment: Internal Calibration

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

Nominal Value (g)	Standard Value (g)	Average Reading (g)	Correction (g)	Uncertainty (± g)	Coverage Factor k
90	90.00010	90.00002	-0.00001	0.000015	2.00
100	100.00006	100.00001	0.00000	0.000016	2.00
110	110.00007	110.00001	0.00000	0.000017	2.00
120	120.00009	120.00002	-0.00001	0.000018	2.00
130	130.00010	130.00002	-0.00001	0.000019	2.00
140	140.00013	140.00002	-0.00001	0.000019	2.00
150	150.00009	150.00002	-0.00001	0.000021	2.00
160	160.00010	160.00002	-0.00001	0.000022	2.00
170	170.00012	170.00002	-0.00001	0.000023	2.00
200	200.00013	200.00002	-0.00001	0.000028	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 %.

for N. Nigubak

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





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Certificate of Calibration

Certificate No.: 260311-2-BL002-26

Code No.: BL002-26

Page: 1 of 4

Customer Name: United Analyst and Engineering Consultant Co., Ltd.
Address: 3 Soi Udom suk 41, Sukhumvit Rd., Bang Chak, Phrakhanong, Bangkok 10260

Equipment: Electronic Balance

Manufacturer: Mettler Toledo

Model: XSR205DU

Serial No.: C009071872

Asset No.: UAE.WAQ.012/2563

Building : UAE number 3 **Floor :** 2 **Room :** 208

Received Date: March 11, 2026

Date of Calibration : March 12, 2026

Calibration Conditions: Temperature 23.8 °C to 24.1 °C
Humidity 50.0 % to 59.0 %
Pressure 755.5 mmHg to 755.6 mmHg

Calibrated by: Thanachat Chatpahol

Approved by: Suwit Chotnok

Issued Date: March 16, 2026

Signature:

Note : 1) The Uncertainties are for a confidence probability of approximately 95%
2) This Certificate is valid only to the item calibrated on date and place of calibration.

3) This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the United Analyst and Engineering Consultant Co., Ltd. (UAE)

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Tel.0 2763 2828 Fax.0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com

Certificate No.: 260311-2-BL002-26

Code No.: BL002-26

Page: 2 of 4

Equipment: Electronic Balance
Model: XSR205DU
Serial No.: C009071872
Max. Capacity: 81 g / 220 g
Calibration Date: March 12, 2026
Condition As-Received: In Condition

Manufacturer: Mettler Toledo

Readability: 0 to 81 (g): 0.01 mg > 80 to 200 (g): 0.1 mg

ID No.: UAE.WAQ.012/2563

Condition of Equipment:

Condition of Test Result of Calibrations:

1. Calibration Method: This instrument was calibrated by method UAE CF CAL 009 In-House Method based on NMS Lab 14 : 2022

Reference Standards:

Standard Weight Class E2 (OMAL)

Standard Weight Class E2 (OMAL)

Model: 1 mg to 1 kg

Serial No.: C510641605

Calibrated By: METTLER TOLEDO GmbH

25-009359

Due Date: 21-Jan-27

Traceability: Mettler-Toledo GmbH

Model: 1 mg to 1 kg

Serial No.: B749109122

Calibrated By: AMARC

25-009359

Due Date: 21-Jan-27

Traceability: Mettler-Toledo GmbH

Model: XHB-3825D

Serial No.: AK-46457

Calibrated By: SUCCESS

SG-H-00992/68

Due Date: 26-Nov-26

Traceability: Success Gateway

Model: XHB-3825D

Serial No.: AK-46457

Calibrated By: TPA

25P4664

Due Date: 18-Dec-26

Traceability: TPA

Calibration Results:

1. Reproducibility of Reading:

Notional Value (g)	Standard Deviation of Reading (g)
80	0.000008
200*	0.000045

2. Eccentric or off-center loading

A mass of 100 g was placed and moved to various position on pan

The Balance reading obtained is given in the table.

1	2	3	4	5	Maximum Difference (g)
100.0000	100.0000	100.0000	100.0000	100.0000	0.0000

C. Oj

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LAE United Analyst and Engineering Consultant Co., Ltd.
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Tel: 0 2763 2828 Fax 0 2763 2800 www.uaconsultant.com E-mail: uae@uaconsultant.com

Certificate No.: 260311-2-BL002-26
Code No.: BL002-26
Page: 3 of 4

Equipment: Electronic Balance Manufacturer: Mettler Toledo
Model: XS205DU Readability: 0 to 81 (g): 0.01 mg > 80 to 200 (g): 0.1 mg
Serial No.: C009071872 ID No.: UAE.WAO.012/2563
Max. Capacity: 81 g / 220 g
Calibration Date: March 12, 2026

Calibration Result: (Continued)
Calibration Range: 0 to 80 (g)
Calibration Adjustment: Internal Calibration

3. Error of indication from nominal or conventional mass value: (Range: 0 to 81 (g); Resolution: 0.00001 g)

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty ($\pm$ mg)	Coverage Factor k
Unload	0.0000000	0.0000	0.0000	0.015	2.25
0.001	0.0010020	0.0010	0.0000	0.015	2.23
0.005	0.0050025	0.0050	-0.00002	0.015	2.23
0.01	0.0100005	0.0100	-0.00002	0.015	2.23
0.05	0.0500003	0.0500	-0.00001	0.015	2.21
0.10	0.1000083	0.1000	-0.00001	0.015	2.20
0.50	0.5000121	0.5000	-0.00002	0.016	2.15
1	1.0000119	1.0000	0.00000	0.016	2.12
2	2.0000125	2.0000	-0.00001	0.017	2.09
5	5.0000146	5.0000	-0.00002	0.020	2.05
10	10.0000330	10.0001	-0.00002	0.023	2.00
20	20.000028	20.0001	-0.00005	0.033	2.00
30	30.000061	30.0001	-0.00004	0.051	2.00
40	40.000054	40.0001	-0.00004	0.063	2.00
50	50.000037	50.0001	-0.00005	0.064	2.00
60	60.000070	60.0001	-0.00004	0.081	2.00
80	80.000098	80.0001	-0.00001	0.11	2.00

c.uy

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Certificate No.: 260311-2-BL002-26
Code No.: BL002-26
Page: 4 of 4

Equipment: Electronic Balance Manufacturer: Mettler Toledo
Model: XS205DU Readability: 0 to 81 (g): 0.01 mg > 80 to 200 (g): 0.1 mg
Serial No.: C009071872 ID No.: UAE.WAO.012/2563
Max. Capacity: 81 g / 220 g
Calibration Date: March 12, 2026

Calibration Result: (Continued)
Calibration Range: > 80 to 200 (g)
Calibration Adjustment: Internal Calibration

3. Error of indication from nominal or conventional mass value: (Range: > 80 to 200 (g); Resolution: 0.0001 g)

Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty ($\pm$ mg)	Coverage Factor k
Unload	0.0000000	0.0000	0.0000	0.02	2.25
90	90.0000910	90.0000	0.0000	0.16	2.00
100	100.0000420	100.0000	0.0000	0.16	2.00
110	110.0000750	110.0000	0.0000	0.17	2.00
120	120.0000680	120.0000	0.0001	0.18	2.00
130	130.0001010	130.0000	0.0000	0.20	2.00
140	140.0000960	140.0003	0.0001	0.21	2.00
150	150.0000790	150.0003	0.0001	0.21	2.00
160	160.0001120	160.0003	0.0001	0.23	2.00
170	170.0001050	170.0003	-0.0002	0.24	2.00
200	200.0001460	200.0004	-0.0002	0.26	2.00

4. Effect of tare test:

Tare Load (g)	Test Load (g)	Indication (g)	Correction (g)
100	20.000028	20.0000	0.0000
	40.000054	40.0002	-0.0001
	60.000070	60.0002	-0.0001
	80.000098	80.0002	-0.0001
	100.000042	100.0003	-0.0002

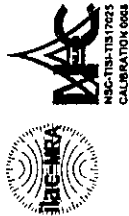
Remarks:

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

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
53/4/4 PATANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL 0-2717-3000-29 FAX 0-2719-9484



Certificate of Calibration

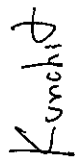
Cert. No.: 26TM196
Page : 1 of 3

Equipment : BOD Incubator
Manufacturer : Arco
Model : UC4-1320
Serial No. : 13JRC4S013201
ID No. : UAE.WAO.015/2561

Submitted by : United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsuk 41, Sukhumvit Road
Bangchak, Phrakhanong
Bangkok 10260
Location : Lab. Floor 2

Received Order : 02 February 2026
Calibration Date : 03 February 2026
Ambient Temperature : $(26 \pm 10) ^\circ\text{C}$
Relative Humidity : $(50 \pm 30) \%$
AC Line Voltage : $(220 \pm 22) \text{ V}$

Calibrated by : Krisda Malee

Approved by : 
Approved Signatory

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

Issue Date : 17 February 2026

The Uncertainties are for a confidence probability of approximately 95%

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Equipment : BOD Incubator
Condition As-Received : Used Item
Reference : 2602-0003OC-1
Procedure Used :-

Cert. No.: 26TM196
Page : 2 of 3

Calibration were conducted using calibration procedure CP-OT02 based on TLAS G-20 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD).
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-
Instrument Serial No. Cert. No. Traceable Due Date
1) Data Acquisition MY57013711 25LM117 TPA 17 Jul 2026

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

3. This measurement result is traceable to the International System of Unit maintained through :

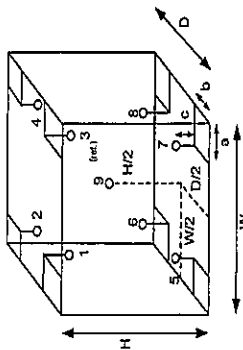
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Not Available

Environment during calibration		
	Beginning	Finished
Temp. (°C)	26	25
REL Humid. (%)	48	49
AC Supply (Volt)	221	220



Probe Installation Details :
a = 10 cm
b = 10 cm
c = 10 cm
Dimension of Chamber :
D = 0.62 m
W = 1.2 m
H = 1.2 m
Capacity = 0.89 m³

Position :	Ref. Std. ID No.:
1	22-18RTD-2/1
2	18RTD-2/2
3	18RTD-2/3
4	18RTD-2/4
5	18RTD-2/5
6	25-18RTD-2/6
7	25-18RTD-2/7
8	21-18RTD-2/10
9 (ref.)	18RTD-2/9

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Equipment : BOD Incubator
Condition As-Received : Used Item
Reference : 2602-00030C-1
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Not Available

Cert. No.: 26TM196
Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor k
20.0	20.0	19.9	0.65	0.40	1.4	2

Measured Temperature (°C)								
Position								
1	2	3	4	5	6	7	8	9 (ref.)
20.0	20.079	19.917	20.065	19.973	19.943	19.959	19.852	19.860
								20.006
								0.84

Average* : The average of 30 values in each position.
Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.
Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.
UUC* : Unit Under Calibration
Note : The reported uncertainty of measurement was included stability and excluded uniformity .
The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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524/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL.0-2717-3000-29 FAX.0-2719-9484



Certificate of Calibration

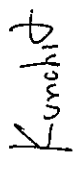
Cert. No.: 25TM578
Page : 1 of 3

Equipment : BOD Incubator
Manufacturer : ARCO
Model : UR-1320
Serial No. :
ID No. : UAE.WAO.006/2553

Submitted by : United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260
Location : Lab Floor 2

Received Order : 19 March 2025
Calibration Date : 19 March 2025
Ambient Temperature : $(26 \pm 10) ^\circ\text{C}$
Relative Humidity : $(50 \pm 30) \%$
AC Line Voltage : $(220 \pm 22) \text{ V}$

Calibrated by : Man Pattanapongpaiboon

Approved by :

Approved Signatory

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

Issue Date : 27 March 2025

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

เอกสารไม่ควบคุม



Equipment : BOD Incubator
Condition As-Received : Used Item
Reference : 2503-04370C-2

Cert. No.: 25TM578
Page : 2 of 3

Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 based on TLAS G-20 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD).
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard Instrument:-
Instrument Serial No. Cert. No. Traceable Due Date
1) Data Acquisition MY44073381 24LM73 TPA 18 May 2025
2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certificate is traceable to the International System of Unit.

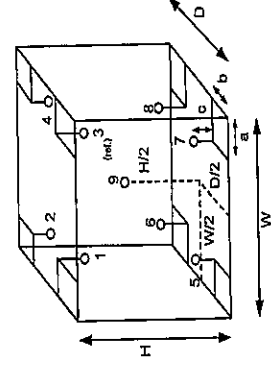
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close

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



Probe Installation Details :

a = 10 cm D = 0.62 m
b = 10 cm W = 1.2 m
c = 10 cm H = 1.2 m
Capacity = 0.89 m³

Position :	Ref. Std. ID No.:
1	1RTD-2/1
2	1RTD-2/2
3	22-01RTD-03
4	1RTD-2/4
5	1RTD-2/5
6	1RTD-2/6
7	23-01RTD-07
8	1RTD-2/8
9 (ref.)	23-01RTD-09

เอกสารไม่ควบคุม



Equipment : BOD Incubator
Condition As-Received : Used Item
Reference : 2503-0437OC-2
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Cert. No.: 25TM578
Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor k
20.0	20.0	19.9	0.49	0.69	1.1	2

Measured Temperature (°C)		Uncertainty (±°C)								
Position										
1	2	3	4	5	6	7	8	9 (ref.)		
20.0	20.025	19.753	20.063	19.839	20.103	20.086	20.152	20.211	19.804	0.69

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

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

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เอกสารไม่ควบคุม



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 FAX. 0-2719-9484

Certificate of Testing

Cert.No.: 26TW50

Page.: 1 of 2

Equipment :

DO Meter

Manufacturer :

YSI

Model :

5100

Serial No. :

11B 101863

ID No. :

UAE.WAO.004/2554

Received Date :

27 February 2026

Test Date :

02 March 2026

Reference :

2502.0815DSC-1

Submitted by :

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

Laboratory Condition :

Temperature (25 ± 5) °C

Humidity (50 ± 20) %

In - house method : CP-CH9

by Comparison Technique with Azide Modification Method

Test Procedure :

Tested by :

Walailak Sirithean

Approved by :

Sailthip

Approved Signatory

() Chakrit Waewwanjua

() Ponpan Paipim

(✓) Sailthip Meangmai

Issue Date :

03 March 2026



Cert.No.: 26TW50

Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

This measurement result is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments

ID No.

Certificate No.

Due Date

1. Burette 130BU10 25CG1126 18 Mar 2027

2. Balance 110RC001 25MM316 02 July 2026

2. Standard Material :-

Material

Manufacturer

Lot.No.

Assay

Sodium Thiosulfate 5-Hydrate AR

KEMAUS

2203162447

99.6%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %

Dissolved Oxygen Probe No.: 24F100202

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.20	8.20	0.0084

This report was certified only for the instrument we tested. It is allowable to use for study intend to use for advertising and referral purpose is prohibited. This report may not be reproduced other in full, without written approval of the laboratory

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เอกสารไม่ควบคุม

เอกสารไม่ควบคุม



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



Cert.No.: 25TW213
Page.: 2 of 2

Certificate of Testing

Cert.No.: 25TW213
Page.: 1 of 2

Equipment : DO Meter
Manufacturer : YSI
Model : 4010-2W
Serial No. : 20260326
ID No. : UAE.WAO.060/2563
Received Date : 17 October 2025
Test Date : 22 October 2025
Reference : 2510-0508DSC-1
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road, Bangchak,
Phrakhanong, Bangkok 10260
Laboratory Condition : Temperature (25 ± 5) °C
Humidity (50 ± 20) %
Test Procedure : In - house method : CP-CH9
by Comparison Technique with Azide Modification Method

Tested by : Walalak Sirithean

Approved by : 
Approved Signatory

() Chakrit Waewwanjua
() Ponpan Peipim
(✓) Saithip Meangmai

Issue Date : 23 October 2025

Condition of this result of calibration

1. Reference Standard Instruments :
This measurement result is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	ID No.	Certificate No.	Due Date
1. Burette	130BU10	25CG1126	18 Mar 2027
2. Balance	110RC001	25MM316	02 July 2026

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate 5-Hydrate AR	KEMAUS	2203162447	99.6%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 22M102385

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.22	8.31	0.0055

This report was certified only for the instrument we tested. It is allowable to use for study
Intend to use for advertising and referral purpose is prohibited. This report may not be reproduced
other in full, without written approval of the laboratory

-o-o-

เอกสารไม่ควบคุม

เอกสารไม่ควบคุม

Date: Feb 12, 2026

Job No.: 145910

Instrument: DT2520

Start	Finish
13:30	15:00

Labour (Hrs)	Travel From Customer (Hrs)
1.5	1.5

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

Report No.: 15257

Customer: UAE

Address: Bangkok

Serial: 9905060

Application	Special	Job Type	Standard
Distributor	Courtesy Visit	Installation	in House
Digital Service	PMA Approval Check	Quote	PM
Internal	Warranty	Repair	HC Visit
Training	Sales Support	Investigate	Others

PMA Type	Smartcare	Smartcare Pro	Fosscore

Details of Work / Test	OK	Not OK
- PM		
- Visual Check		
+ No leak		
+ No damage		
- Change PM kit x 1 set		
- Function Check		
+ Quick mode		
+ Set Temp / timer		
+ Run		
- heating		
- Lift up/down		
- Clean x90 holes with brush head		

Part No.	Batch	Description	Qty
60070930	27.09.2025	F0D PM kit, Digistar 20 per, 12 units	1

I confirm this report is accurate and complete			
Signed FOSS	Signed Customer		
Name: Anna / Rattana / Dekkarn	Name		
Tel:	Tel:		
Email:	Email:		

*Remark:

เอกสารไม่ควบคุม

Please scan QR code



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
53/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL.0-2717-3000-23 FAX.0-2719-9484

Certificate of Calibration

Cert. No.: 25TM579
Page: 1 of 3

Equipment: Hot Air Oven
Manufacturer: Memmert
Model: UF 55
Serial No.: B212.0411
ID No.: UAE.WAO.005/2556
Submitted by: United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260
Lab Floor 2

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: Man Pattanapongpalboon

Kunchit

Approved Signatory

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

Issue Date: 27 March 2025

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services

เอกสารไม่ควบคุม



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2503-0437OC-3

Cert. No.: 25TM579
Page : 2 of 3

Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 based on TLAS G-20 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD) and Thermocouple Type T.

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-
Instrument Serial No. Cert. No. Due Date
1) Data Acquisition MY44073381 24LM73 18 May 2025
Traceable TPA
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.

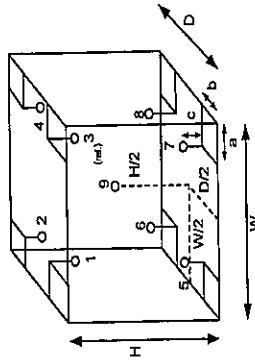
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :-

Function of UUC* : (*) Without Adjustment

Fresh air setting : Temperature Source

Close



Probe Installation Details :		Dimension of Chamber :	
a =	5.0 cm	D =	0.50 m
b =	5.0 cm	W =	0.80 m
c =	5.0 cm	H =	0.75 m
		Capacity =	0.30 m ³

Environment during calibration		
	Beginning	Finished
Temp. (°C)	27	28
REL.Humid. (%)	49	55
AC Supply (Volt)	221	224

Ref. Std. ID No.: @ Calibration Point	
Position : (120,180) °C	(104) °C
1	23-01TC-01 1RTD-2/1
2	23-01TC-02 1RTD-2/2
3	23-01TC-03 22-01RTD-03
4	23-01TC-04 1RTD-2/4
5	23-01TC-05 1RTD-2/5
6	23-01TC-06 1RTD-2/6
7	23-01TC-07 23-01RTD-07
8	23-01TC-08 1RTD-2/8
9 (ref.)	23-01TC-09 23-01RTD-09



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2503-0437OC-3
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Cert. No.: 25TM579
Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor k
104.0	104.0	104.0	0.040	0.43	0.78	2
120.0	120.0	120.0	0.64	1.3	1.6	2
180.0	180.0	180.0	0.49	1.5	1.8	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (± °C)
	1	2	3	4	5	6	7	8	9 (ref.)	
104.0	104.335	104.195	104.363	104.317	103.649	103.738	104.179	104.229	104.025	0.42
120.0	119.575	119.366	119.807	119.905	118.994	119.194	119.888	119.994	120.064	1.1
180.0	180.286	179.510	180.401	180.551	179.281	179.463	180.196	180.451	180.374	1.2

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

Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.

UUC* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity .

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

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เอกสารไม่ควบคุม

เอกสารไม่ควบคุม

Calibration Certificate

Certificate No.: 2602303-006-01
Page : 1 of 2

Equipment: CHAMBER (Incubator)
Manufacturer: BINDER
Model: KB 400
Serial No.: 2020000015535
ID No.: UAE MIC 0162564
Order No.: 2602303
Operation No.: 2602303-006
Date of Receipt: 11 March 2026
Date of Calibration: 11 March 2026

Customer Name: UNITED ANALYST AND ENGINEERING CONSULTANT CO. LTD.
Address: 3 Sri Udomsuk 41, Sukhumvit Road,
Bangkok, Prathumwan, Bangkok 10250

Metrological Traceability:

1. Calibration Method:

- This instrument was calibrated by inserting 9 standard thermometers into its chamber, in accordance with W-TE-014, based on TIAS G-20-102-08 (E). Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
- The temperature scale used in this laboratory is the International Temperature Scale of 1990 (ITS-90).
- All data shown below are final values, and the initial data may be obtained upon request.

2. Reference Standard Instrument:

Instrument	Model/Type	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	DAQ973A	MY50008864	2502244-001-01	29 March 2026	NATIONAL FOOD INSTITUTE
	RTD	CHF001-209/RTD201-209			

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

4. This certificate is valid only for the instrument that was calibrated.

5. The result of this calibration was found to be accurate only on the date and at the place of calibration shown.

Calibrated by	Mr.Nuttapol Wiyomchat Specialist	Approved by	(Mr.Pheraphat Tuanjit) Manager, Division of Calibration Laboratory Responsible for the Technical Management Team
Date of Issue:	19 March 2026		

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 recognised 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.



Calibration Certificate

Certificate No.: 2602303-006-01
Page : 2 of 2

Calibration Condition:

Equipment: CHAMBER (Incubator)
UUC* Resolution: 0.1 °C
Condition of the item: Normal & Good
Without adjustment / As Found
* Time of record 1 hour 9 minute / point

Place of Calibration: Microbiology Laboratory
UNITED ANALYST AND ENGINEERING CONSULTANT CO. LTD

Environment Conditions: Ambient Temperature (17.2 ± 1) °C
Relative Humidity (51.5 ± 4) %
Line Voltage (229 ± 2) V.

Calibration Results:

Table 1 : Reporting of Temperature

Calibration Point (°C)	Measured Temperature (°C) @ Sensor No. 9 is REF										Measurement Uncertainty (±°C)
	Std.#1	Std.#2	Std.#3	Std.#4	Std.#5	Std.#6	Std.#7	Std.#8	Std.#9		
35.0	34.78	34.86	34.81	34.83	35.22	35.21	35.22	35.12	34.83		0.28

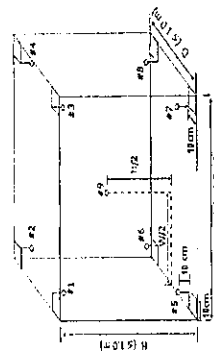
Table 2 : Reporting of Characterization Results

UUC* Setting (°C)	UUC* Reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	Max	Average	Min			
35.0	35.0	35.0	35.0	0.034	0.39	0.52

Note

- UUC* : Unit Under Calibration
 - The quoted uncertainty includes contributions from 'Stability' and 'Loading Effect' (20% of Temperature Uniformity).
 - Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors, for at least half an hour after reaching steady state.
 - Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.
 - Overall Variation = The difference of The maximum and minimum measured temperatures throughout observation time.
- For more information, details of the sensor installation should be reported.

-	Open	-	Position
X	Close	100%	Fan speed
-	-	-	Not Available
Dimension of robot chamber and sensor installation location (cm)			
W x H x D	65	x	125 x 48
a x b x c	10	x	10 x 10



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 of Report -----



Calibration Certificate

Certificate No.: 2503682-004-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road,
Bangchack, Prakhnong, Bangkok 10260

Page 1 of 3

Equipment: CHAMBER (Incubator)

Manufacturer: BINDER

Model: KB 400

Serial No.: 20220000022479

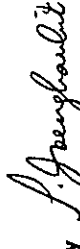
ID No.: UAE.MTC.028/2566

Order No.: 2503682

Operation No.: 2503682-004

Date of Receipt: 1 July 2025

Date of Calibration: 1 July 2025

Calibrated by Mr. Phraphat Tuanjit
Scientist
Approved by 
(Miss Preeyaporn Jaengkarnkit)
Vice President, Department of Laboratory Services
Responsible for the Technical Management Team

Date of Issue: 3 July 2025

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

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

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

Calibration Report

Certificate No.: 2503682-004-01
Equipment: CHAMBER (Incubator)
Model: KB 400
Serial No.: 20220000022479
Resolution: 0.1 °C
ID No.: UAE.MTC.028/2566
Manufacturer: BINDER
Date of Calibration: 1 July 2025

Page 2 of 3

Location: Microbiology Laboratory, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Environment Condition:

Ambient Temperature (21 ± 1) °C
Relative Humidity (55 ± 10) %
Line Voltage (230 ± 5) Volt

Condition of this results of Calibration:

1. This instrument was calibrated by insert 13 standard thermometer into its chamber and calibration according to WTE-014 Based on TIAS 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	MY59003377	2501168-001-01	13 January 2026	NATIONAL FOOD INSTITUTE
	RTD	CH#101-203 / RTD#101-203			

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

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

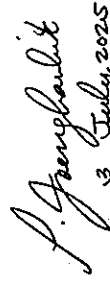
5. This result of calibration was found accurate as shown on date and place of calibration only.

6. Condition of Calibrated item : Good

UUC Description :

Time of Record 1 Hour 9 Minute At 35.0 °C
Fresh air Damper - Open Position -
Close Close Fan 100%
Not Available

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


3 July 2025

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



Calibration Report

Certificate No.: 2503682-004-01
Equipment: CHAMBER (Incubator)
Model: KB 400
Serial No.: 2022080022479
Resolution: 0.1 °C
ID No.: UAE.MIC.028/2566
Manufacturer: BINDER
Date of Calibration: 1 July 2025

Page 3 of 3

Calibration point: 35.0 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	20.1	45	225.0
MAX	22.0	65	235.0

Table 1 : 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	35.19	35.03	34.83	35.21	34.96	34.94	34.84	34.64	35.06	34.94	35.15	34.79	34.92	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			
34.8	34.8	34.8	34.8	0.040	0.29	0.50

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

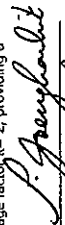
UUC* = Unit Under Calibration

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

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

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

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

----- End -----

3 July 2025

Calibration Certificate

Certificate No.: 2503287-002-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road,
Bangchack, Prakanong, Bangkok 10260

Page 1 of 3

Equipment: CHAMBER (Incubator)
Manufacturer: BINDER
Model: KB 400
Serial No.: 20220800000391
ID No.: UAE.MIC.029/2565

Order No.: 2503287
Operation No.: 2503287-002
Date of Receipt: 5 June 2025
Date of Calibration: 5 June 2025

Calibrated by Mr.Pheraphat Tuanjit
Scientist
Approved by 
(Miss Pheeyaporn Jaengkarnkit)
Vice President, Department of Laboratory Services
Responsible for the Technical Management Team
Date of Issue: 11 June 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.



Calibration Report

Certificate No.: 2503287-002-01
Equipment: CHAMBER (Incubator)
Model: KB-400
Serial No.: 20220000000391
Resolution: 0.1 °C
ID No.: UAE.MIC.029/2565
Manufacturer: BINDER
Date of Calibration: 5 June 2025

Page 2 of 3

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

Environment Condition:
Ambient Temperature (18 ± 1) °C
Relative Humidity (53 ± 6) %
Line Voltage (230 ± 5) Volt

Condition of this results of Calibration:

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

Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY59003377	2501168-001-01	13 January 2026	NATIONAL FOOD INSTITUTE
	RTD	CH#101-203 / RTD#101-203			

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 ☒ Close ☐ Fan 100% ☒

Not Available

Without adjustment ☐

After adjustment ☐

7. Result of Calibration :

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



Calibration Report

Certificate No.: 2503287-002-01
Equipment: CHAMBER (Incubator)
Model: KB-400
Serial No.: 20220000000391
Resolution: 0.1 °C
ID No.: UAE.MIC.029/2565
Manufacturer: BINDER
Date of Calibration: 5 June 2025

Page 3 of 3

Calibration point: 35.0 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	17.4	48	225.0
MAX	18.5	59	235.0

Table1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No.													Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	
35.0	35.08	35.11	35.01	35.13	35.17	35.09	34.98	34.89	35.05	35.06	34.89	35.06	35.06	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	35.1	35.0	0.038	0.17	0.34

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

UUC* = Unit Under Calibration

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

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

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

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

----- End -----

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



FOSS

Customer Service Report

Date: Feb 12, 2026

Job No.: 14589

Instrument: K9 Distillator

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

Report No.: 15256

Customer: UAE

Address: Bangkok

Serial: 9105302

Start	Finish	Labour (Hrs)
07:00	09:30	1.5

Labour (Hrs)	Travel From Customer (Hrs)
07:30	4
13:30	

Application	Special	Standard
Distributor	Courtesy Visit	In House
Digital Service	PMA Approval Check	Quote
Internal	Warranty	Repair
Training	Sales Support	Investigate
		Others

PMA Type	Smartcare	Smartcare Pro	Fosscore	Y
	Smartcare Advance	Fosscore Pro	N/A	

Details of Work / Test	OK	Y	Not OK*
- PMA -			
- Visual Check			
+ No leak			
+ No damage			
- change PM kit x1 Set			
- Function Check			
+ Division			
+ Allen			
+ Receiver			
+ System Advise			

Part No.	Batch	Description	Qty
60100146	11-03-2025	PM kit replace & distillator	1

I confirm this report is accurate and complete			
Signed FOSS	Signed Customer	Name	
Name: Ananta Patchas / Jakkrit			
Tel:			
Email:			

*Remark: เอกสารไม่ควบคุม

Please scan QR code



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



NSC-TEP-1317023
CALIBRATION 0009

Certificate of Calibration

Cert.No.: 25CH1433
Page.: 1 of 3

Equipment: pH Meter
Manufacturer: Horiba
Model: LAQUA-PH210
Serial No.: HA0A0005
ID No.: UAE.EFM.004/2563(EFM.pH.04/63)
Condition As-Received:
Received Date: 09 December 2025
Calibration Date: 11 December 2025
Reference: 2512-0243WSC-2
Submitted by: United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udonsuk 41, Sukhumvit Road, Bangkok,
Phrakhanong, Bangkok 10260
Ambient Temperature: (25 ± 2.5) °C
Relative Humidity: (50 ± 15) %
Calibration Procedure: In - house method :
- CP-CH5 by direct measurement with DC voltage standard and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with temperature standard

Calibrated by: Warakorn Lemgagtrakul

Approved by: Approved Signatory

(✓) Chakrit Waewwanjua
() Ponpan Paipim
() Saithip Meangmal

Issue Date: 12 December 2025

The Uncertainties are for a confidence probability of approximately 95%

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Cert.No.: 25CH1433
Page.: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument

- | Instrument | Serial No. | ID No. | Cert. No. | Due Date |
|--------------------------------|------------|----------|-----------|--------------|
| 1) Document Process Calibrator | 54030049 | 130RC116 | 25E2743 | 25 Aug 2026 |
| 2) Ref. Standard Thermometer | 4982054 | 110RC044 | 25I708 | 03 July 2026 |
- This measurement result is traceable to SI through Technology Promotion Association (Thailand - Japan)
2. Certified Reference Materials :The measurement results are traceable to SI through Hach Lange GmbH Ltd.,
Deutsche Akkreditierungsstelle, Accredited No.D-RM-15184-01-00
:The measurement results are traceable to SI through CPA chem Ltd.,
ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.007	CPA chem	1114384	12 June 2027
pH 6.999	Hach Lange GmbH	003273	13 May 2027
pH 10.010	CPA chem	1114385	08 June 2026

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

Calibration Results

Function : mV Measurement

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

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (mV)	Coverage factor k
			mV	pH		
pH Meier S/N.: HA0A0005	4.00	177.48	177.4	4.01	0.058	2.00
	7.00	0.00	0.1	7.00	0.058	2.00
	7.00	0.00	0.1	7.00	0.058	2.00
	10.00	-177.48	-177.2	10.01	0.058	2.00



Cert.No.: 25CH1433
Page.: 3 of 3

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7)(7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor k
pH Electrode S/N.: -	4.007	4.01	175.4	0.0085	2.05
	6.999	7.00	-0.3	0.0095	2.00
	6.999	7.01	-0.5	0.0096	2.00
	10.010	10.01	-170.6	0.0092	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model :
- Serial No. :

Dimension of probe

- Length : 112 mm.
- Diameter : 16 mm.
- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
15.0	15.002	15.0	-0.002	0.13	2.00
30.0	30.002	30.0	-0.002	0.13	2.00
45.0	45.003	45.0	-0.003	0.13	2.00

Remark - UUC* = Unit Under Calibration

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

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เอกสารไม่ควบคุม



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SQ1 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL.0-2717-3000-29 FAX.0-2719-9484



Certificate of Calibration

Equipment :

Manufacturer :

Model :

Serial No. :

ID No. :

Condition As-Received:

Received Date :

Calibration Date :

Reference :

Submitted by :

Ambient Temperature :

Relative Humidity :

Calibration Procedure :

Calibrated by :

Approved by :

() Chakrit Waewwanjua
() Ponpan Paipim
(✓) Saithip Meangmai

Issue Date :

pH Meter

Horiba

LAQUA-PH210

HA9M0047

UAE.EFM.005/2563 (EFM.pH.05/63)

Used Item

24 February 2026

26 February 2026

2602-0796WSC-2

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

(25 ± 2.5) °C

(50 ± 15) %

In - house method :

- CP-CH5 by direct measurement with DC voltage
standard and direct measurement with
certified reference material (CRM)

- CP-CH8 by comparison with temperature standard

Walalak Sirithean

Approved Signatory

27 February 2026

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.



Cert.No.: 26CH231
Page.: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument

Instrument Serial No. ID No. Cert. No. Due Date
1) Document Process Calibrator 54030049 130RC116 25E2743 25 Aug 2026
2) Ref. Standard Thermometer 4982054 110RC044 25I708 03 July 2026
- This measurement result is traceable to SI through Technology Promotion Association (Thailand - Japan)
2. Certified Reference Materials :The measurement results are traceable to SI through Hach Lange GmbH Ltd.,
Deutsche Akkreditierungsstelle, Accredited No.D-RM-15184-01-00
:The measurement results are traceable to SI through CPA chem Ltd.,
ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution

Lot No. Exp. date
pH 4.008 CPA chem 1187328 18 Jan 2028
pH 7.000 Hach Lange GmbH C03319 17 Oct 2027
pH 10.010 CPA chem 1187332 18 Jan 2027

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

Calibration Results

Function : mV Measurement

Performing standard curve by Document Process Calibrator at pH (4.7)(7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (mV)	Coverage factor k
			mV	pH		
pH Meter S/N.: HA9M0047	pH 4.00	177.48	177.3	4.01	0.058	2.00
	pH 7.00	0.00	0.0	7.02	0.058	2.00
	pH 10.00	0.00	0.0	7.02	0.058	2.00



Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4.7)(7.10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor k
pH Electrode	4.008	4.01	161.1	0.0079	2.00
S/N.: -	7.000	7.00	-10.4	0.0096	2.00
	7.000	7.00	-9.9	0.0095	2.00
	10.010	10.02	-177.9	0.0095	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : _____

- Serial No. : _____

Dimension of probe

- Length : 103 mm.

- Diameter : 16 mm.

- Immersion Depth : 90 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
15.0	15.001	15.0	-0.001	0.13	2.00
30.0	30.001	30.0	-0.001	0.13	2.00
45.0	45.001	44.9	-0.101	0.13	2.00

Remark - UUC* = Unit Under Calibration

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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Certificate of Calibration

Cert.No.: 26CH446
Page.: 1 of 3

Equipment : pH Meter
Manufacturer : Horiba
Model : LAQUA-PH210
Serial No. : HA0D0082
ID No. : UAE.EFM.072/2564(EFM.pH.05/64)

Condition As-Received: Used Item
Received Date : 24 April 2026
Calibration Date : 27 April 2026
Reference : 2604-0562WSC-2

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

Ambient Temperature : (25 ± 2.5) °C

Relative Humidity : (50 ± 15) %

Calibration Procedure : In - house method :

- CP-CH5 by direct measurement with DC voltage standard and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with temperature standard

Calibrated by : Uthen Kankawi

Approved by : _____
Approved Signatory

(✓) Chakrit Waewwanjua
() Ponpan Paipim
() Sathip Meangmai

Issue Date : 28 April 2026

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Cert.No.: 26CH446
Page.: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	58440003	130RC120	25E3502	10 Nov 2026
2) Ref. Standard Thermometer	4982054	110RC044	25I708	03 July 2026
- This measurement result is traceable to SI through Technology Promotion Association (Thailand - Japan)				
2. Certified Reference Materials :The measurement results are traceable to SI through Hach Lenge GmbH Ltd., Deutsche Akkreditierungsstelle, Accredited No.D-RM-15184-01-00 :The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AR-1835				

Buffer Solution

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.008	CPA chem	1187328	18 Jan 2028
pH 7.000	Hach Lenge GmbH	C03319	17 Oct 2027
pH 10.010	CPA chem	1187332	18 Jan 2027

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

Calibration Results

Function : mV Measurement

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

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (mV)	Coverage factor k
			mV	pH		
pH Meter S/N.: HA0D0082	4.00	177.48	177.5	4.00	0.058	2.00
	7.00	0.00	0.2	7.00	0.058	2.00
	7.00	0.00	0.2	7.00	0.058	2.00
	10.00	-177.48	-177.2	10.00	0.058	2.00



Cert.No.: 26CH446
Page.: 3 of 3

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7)(7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor k
pH Electrode S/N.: Q9AA0036	4.008	4.01	159.8	0.0091	2.07
	7.000	7.00	-14.2	0.0092	2.00
	7.000	7.00	-15.9	0.0092	2.00
	10.010	10.01	-186.7	0.0096	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : 9652-10D
- Serial No. : Q9AA0036

Dimension of probe

- Length : 103 mm.
- Diameter : 16 mm.
- Immersion Depth : 80 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
15.0	15.006	15.0	-0.006	0.13	2.00
30.0	30.004	30.0	-0.004	0.13	2.00
35.0	45.009	45.0	-0.009	0.13	2.00

Remark - UUC* = Unit Under Calibration

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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MULTI-POINT GAS TEST REPORT

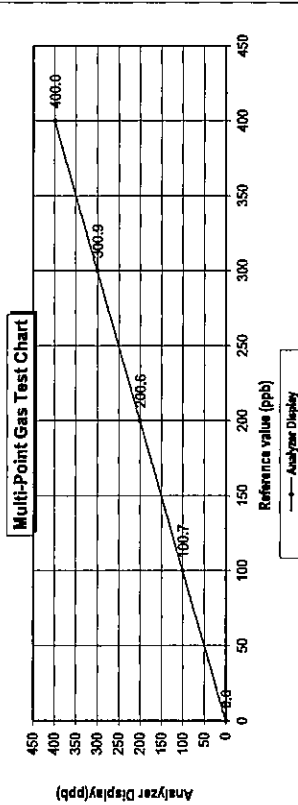
Test Date : Sep 20, 2024

Equipment : Gas Analyzer (NO₂) Model : 421
Manufacturer : Thermo Scientific Serial Number : CW22387040

Standard Gas Concentration
Sulphur Dioxide (SO₂) 42.89 PPM Manufacturer : Thermo Scientific
Nitric Oxide (NO) 46.77 PPM Model : 1461
Methane (CH₄) - PPM Serial Number : 1180540071
Carbon Monoxide (CO) 965.9 PPM
Cylinder No. : EB0159156
Expiration Date : Nov 6, 2026

Multi-point gas test data

Reference Value (ppb)	Analyzer Display (ppb)	Difference Error	Percent Error	% Error
Level 1 Zero 0.0	0.0	0.00	0.00	0.00
Level 2 20.00%	100.7	0.70	0.70	0.70
Level 3 40.00%	200.6	0.60	0.30	0.30
Level 4 60.00%	300.9	0.90	0.30	0.30
Level 5 80.00%	400.0	0.00	0.00	0.00
Remark : Measuring Range 500.0 ppb				
Acceptable Limit $\pm$ 5%				
Average Difference (%) 0.26				



Calculate by *Jimman. C*
20/9/2567
Approve by *P. Udom*
20 Sep 2024

MULTI-POINT GAS TEST REPORT

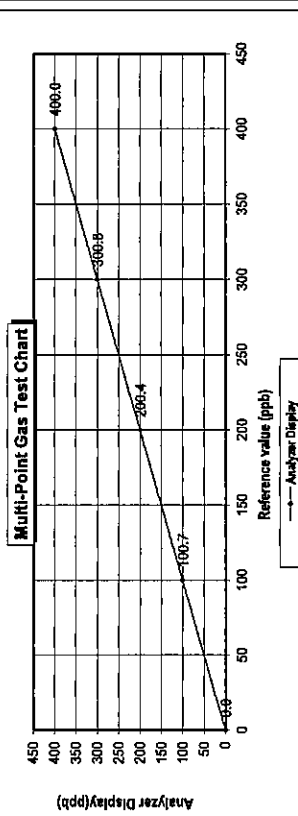
Test Date : Sep 4, 2024

Equipment : Gas Analyzer (SO₂) Model : 431
Manufacturer : Thermo Scientific Serial Number : 1180540065

Standard Gas Concentration
Sulphur Dioxide (SO₂) 42.89 PPM Manufacturer : Thermo Scientific
Nitric Oxide (NO) 46.77 PPM Model : 1461
Methane (CH₄) - PPM Serial Number : 1180540071
Carbon Monoxide (CO) 965.9 PPM
Cylinder No. : EB01159156
Expiration Date : Nov 06, 2026

Multi-point gas test data

Reference Value (ppb)	Analyzer Display (ppb)	Difference Error	Percent Error	% Error
Level 1 Zero 0.0	0.0	0.00	0.00	0.00
Level 2 20.00%	100.7	0.70	0.70	0.70
Level 3 40.00%	200.4	0.40	0.20	0.20
Level 4 60.00%	300.8	0.80	0.27	0.27
Level 5 80.00%	400.0	0.00	0.00	0.00
Remark : Measuring Range 500.0 ppb				
Acceptable Limit $\pm$ 5%				
Average Difference (%) 0.23				



Calculate by *Jimman. C*
4/9/2567
Approve by *P. Udom*
4 Sep 2024

MULTI-POINT GAS TEST REPORT

Test Date : Sep 2, 2024

Equipment : Hydrocarbon Analyzer Model : APHA-370
Manufacturer : HORIBA Serial Number : 93JN1M9

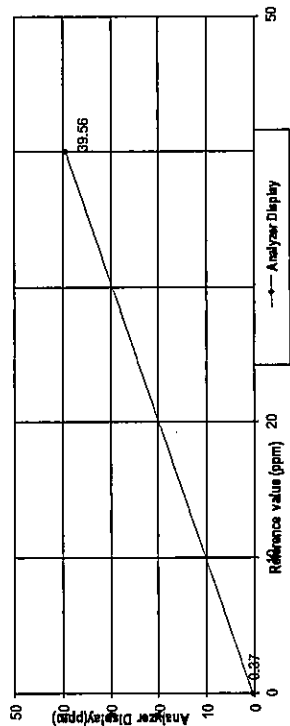
Standard Gas Concentration
Sulphur Dioxide (SO₂) PPM
Nitric Oxide (NO) PPM
Methane (CH₄) PPM
Carbon Monoxide (CO) PPM
Cylinder No. : D824432
Expiration Date : Aug 4, 2028

Dilutor Detail
Manufacturer : PPM
Model : PPM
Serial Number : PPM

Multi-point gas test data

Reference Value (ppm)	Analyzer Display (ppm)	Difference Error	Percent Error	% Error
Level 1 Zero	0.00	0.37	0.37	0.37
Level 2 80.00%	40.00	-0.44	-1.11	1.11
Remark : Measuring Range 50.00 ppm		Average Difference (%)		
		Acceptable Limit $\pm 5\%$		

Multi-Point Gas Test Chart



Calculate by
S. Chan. C.

Approve by
S. Chan. C.

2.....1.....2567.....
.....2.....1.....2024.....

MULTI-POINT GAS TEST REPORT

Test Date : Sep 3, 2024

Equipment : Gas Analyzer (CO) Model : 481
Manufacturer : Thermo Scientific Serial Number : CH08140004

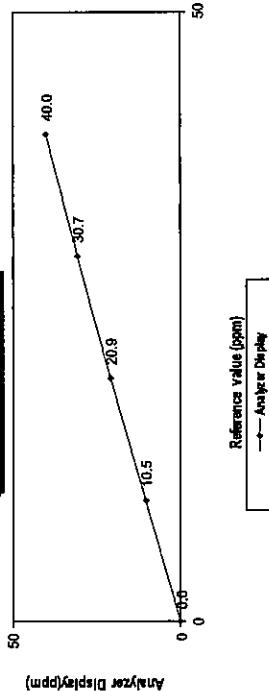
Standard Gas Concentration
Sulphur Dioxide (SO₂) PPM
Nitric Oxide (NO) PPM
Methane (CH₄) PPM
Carbon Monoxide (CO) PPM
Cylinder No. : EB01159156
Expiration Date : Nov 06, 2026

Dilutor Detail
Manufacturer : Thermo Scientific
Model : 146
Serial Number : 1180540071

Multi-point gas test data

Reference Value (ppm)	Analyzer Display (ppm)	Difference Error	Percent Error	% Error
Level 1 Zero	0.0	0.0	0.0	0.0
Level 2 20.00%	10.5	0.5	4.8	4.8
Level 3 40.00%	20.9	0.9	4.3	4.3
Level 4 60.00%	30.7	0.7	2.3	2.3
Level 5 80.00%	40.0	0.0	0.0	0.0
Remark : Measuring Range 50.0 ppm		Average Difference (%)		
		Acceptable Limit $\pm 5\%$		

Multi-Point Gas Test Chart



Calculate by
S. Chan. C.

Approve by
S. Chan. C.

3.....1.....2567.....
.....3.....1.....2024.....

MULTI-POINT GAS TEST REPORT

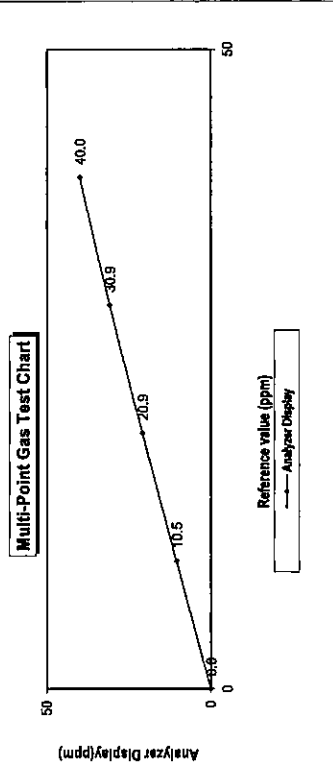
Test Date : July 4, 2025

Equipment : Gas Analyzer (CO) Model : 48C
Manufacturer : Thermo Environmental Instruments Serial Number : 48C-62494-335/5

Standard Gas Concentration
Sulphur Dioxide (SO₂) 42.89 PPM Manufacturer : Thermo Scientific
Nitric Oxide (NO) 46.77 PPM Model : 1461
Methane (CH₄) - PPM Serial Number : 1180540071
Carbon Monoxide (CO) 965.9 PPM
Cylinder No. : EN01159156
Expiration Date : Nov 06, 2026

Multi-point gas test data

Level	Reference Value (ppm)	Analyzer Display (ppm)	Difference Error (ppm)	Percent Error	% Error
Level 1	Zero	0.0	0.0	0.0	0.0
Level 2	20.00%	10.0	0.5	4.8	4.8
Level 3	40.00%	20.0	0.9	4.3	4.3
Level 4	60.00%	30.0	0.9	2.9	2.9
Level 5	80.00%	40.0	0.0	0.0	0.0
Remark : Measuring Range 50.0 ppm			Average Difference (%)		
Acceptable Limit $\pm$ 5%			2.40		



Calculate by
Yuthai Cj
4 July 2025

Approve by
Yuthai Cj
4 July 2025



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



CALIBRATION 0066

Certificate of Calibration

Cert.No.: 25CH1432
Page.: 1 of 3

Equipment : pH Meter
Manufacturer : Horiba
Model : LAQUA-PH210
Serial No. : HA9M0046
ID No. : UAE.EFM.001/2563(EFM.pH.01/63)
Condition As-Received: Used Item
Received Date : 09 December 2025
Calibration Date : 11 December 2025
Reference : 2512-0243WSC-1
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road, Bangkok, Phrakhanong, Bangkok 10260
Ambient Temperature : (25 $\pm$ 2.5) °C
Relative Humidity : (50 $\pm$ 15) %
Calibration Procedure : In - house method :
- CP-CH5 by direct measurement with DC voltage standard and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with temperature standard

Calibrated by : Warakorn Lemgagtrakul

Approved by :
Approved Signatory

(✓) Chakrit Waewwanjua
() Ponpan Paipim
() Sailhip Meangmai

Issue Date : 12 December 2025

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Cert.No.: 25CH1432
Page: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	25E2743	25 Aug 2026
2) Ref. Standard Thermometer	4982054	110RC044	25I708	03 July 2026

- This measurement result is traceable to SI through Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials

:The measurement results are traceable to SI through Hach Lange GmbH Ltd.,
Deutsche Akkreditierungsstelle, Accredited No.D-RM-15184-01-00
:The measurement results are traceable to SI through CPA chem Ltd.,
ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution

Manufacturer	Lot No.	Exp. date
CPA chem	1114384	12 June 2027
Hach Lange GmbH	C03273	13 May 2027
CPA chem	1114385	08 June 2026

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

Calibration Results

Function : mV Measurement

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

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (mV)	Coverage factor k
			mV	pH		
pH Meter S/N.: HA9M0046	4.00	177.48	177.6	4.01	0.058	2.00
	7.00	0.00	0.2	7.00	0.058	2.00
	7.00	0.00	0.2	7.00	0.058	2.00
	10.00	-177.48	-177.1	10.01	0.058	2.00

เอกสารไม่ควบคุม



Cert.No.: 25CH1432
Page: 3 of 3

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7)(7,10)

Unit Under Calibration	Standard Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor k
pH Electrode S/N.: Q9AA0227	4.007	4.00	173.1	0.0079	2.00
	6.999	6.99	-1.6	0.0085	2.00
	6.999	7.00	-0.8	0.0092	2.00
	10.010	10.00	-165.5	0.0095	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : 9652-10D

- Serial No. : Q9AA0227

Dimension of probe

- Length : 112 mm.

- Diameter : 16 mm.

- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
15.0	15.005	15.0	-0.005	0.13	2.00
30.0	30.005	30.0	-0.005	0.13	2.00
45.0	45.003	45.0	-0.003	0.13	2.00

Remark - UUC* = Unit Under Calibration

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

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เอกสารไม่ควบคุม

ภาคผนวก จ
หนังสือรับรองการขึ้นทะเบียน
ห้องปฏิบัติการวิเคราะห์เอกชน

ที่ ๓๓ ๐๓๐๓(๑) ๓๓ ๓๓



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๑๐ มิถุนายน ๒๕๖๕

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท ยูนิค แอนนาลิสต์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอติดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๒๕ กุมภาพันธ์ ๒๕๖๕

ตามคำขอที่อ้างถึง บริษัท ยูนิค แอนนาลิสต์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๕๕ สถานที่ตั้งเลขที่ ๓ ซอยอุดมสุข ๕๓ ถนนสุขุมวิท แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร ความละเอียดดังนี้

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๔ ราย

๑) นายณัฐพงศ์ เนื่องชัย ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๕๕

๒) นายณัฐกร พรหมเอกรัง ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๐

๓) นายศุภณันท์ อุตสาหกรรมานนท์ ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๔) นางสาวบุษผา บุญอมศรี ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๒. ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๒๔ ราย

๑) นายเจษฎา มาประสิทธิ์ ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๐

๒) นางสาวณัฐกมล อิ่มดี ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๓) นายสุรชัย บุพศิริ ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๐

๔) นางสาวปวีณ์ วรดี ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๕) นางสาวอริศญา สุรจิต ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๖) นางสาววันทยา วิเชียรมาศ ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๗) นายธนเดช แก้วประสิทธิ์ ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๘) นายวิฑิต สดใส ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๙) นางสาวพวงมณี ศรีศา ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๑๐) นายภูธร มีสำน ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๑๑) นายศรินทร์ หอมหว้า ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๑๒) นายสันติ คำขันคร ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๑๓) นายวิฑิต วรารัตน์ ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๑๔) นายจักรพงษ์ สัตถ์สาร ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๑๕) นายประจักษ์ โพธิ์ทอง ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๑๖) นายชนะพันธ์ อิ่มนพรัตน์ ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๓๓) นายณัฐ...

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ที่ ๓๓ ๐๓๐๓(๑) ๓๓ ๓๓



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๑๔ ตุลาคม ๒๕๖๕

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท ยูนิค แอนนาลิสต์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด

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ตามคำขอที่อ้างถึง บริษัท ยูนิค แอนนาลิสต์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๕๕ สถานที่ตั้งเลขที่ ๓ ซอยอุดมสุข ๕๓ ถนนสุขุมวิท แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร ความละเอียดดังนี้

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๓ ราย ดังนี้

๑) นางสาวศรียา พรมรัมย์ ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๒) นางสาวศศิธร ทองขาว ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๓) นางสาวปวีณา แดงชนบท ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นางสาวปวีณาพร คุณประเสริฐ)
ผู้อำนวยการฝ่ายเทคนิคและสิ่งแวดล้อม
ปฏิบัติการวิเคราะห์เอกชนโรงงานอุตสาหกรรม

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กองวิจัยและพัฒนาผลิตภัณฑ์โรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบผลิตภัณฑ์และระบบบำบัดน้ำเสีย

โทร. ๐ ๒๕๓๖ ๖๓๖๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๓๖ ๖๓๖๒ ต่อ ๒๑๐๓-๕

ไปรษณีย์อิเล็กทรอนิกส์ sarabangad@wmail.go.th



"อุตสาหกรรมก้าวไกล ประสิทธิภาพก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ ๓๓ ๐๓๐๓(๑) ๓๓ ๓๓



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๑๕ มีนาคม ๒๕๖๕

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

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กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๔ ราย

๑) นายพิรุณ เจริญผล ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๐๓

๒) นายเจษฎา ชัยศรี ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๓) นายศุภกร สานศิริ ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๔) นางสาวณัฐกมล พลนิกรกิจ ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๒. ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๙ ราย

๑) นายณัฐศักดิ์ ห้าทอง ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๒) นางสาวอนันต์ และกระโทก ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๓) นางสาววันทยา บุรีดี ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๔) นางสาวณัฐกมล แซ่มณี ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๕) นางสาวณัฐกมล การงานดี ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๖) นายอนุชา เหมนาค ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๗) นางสาวพัชรินทร์ แพร่ทอง ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๘) นางสาววันพร รินราช ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

๙) นางสาวชญาณี เมินระโทก ทะเบียนเลขที่ ๖-๑๕๕-๖-๐๐๖๓

อนึ่ง หนังสือฉบับนี้จะส่งผู้อำนวยการหน่วยงานที่เกี่ยวข้องไปยังทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ในวันที่ ๒ กุมภาพันธ์ ๒๕๖๕

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

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กองวิจัยและพัฒนาผลิตภัณฑ์โรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบผลิตภัณฑ์และระบบบำบัดน้ำเสีย

โทร. ๐ ๒๕๓๖ ๖๓๖๒ ต่อ ๒๑๐๓-๕

ไปรษณีย์อิเล็กทรอนิกส์ sarabangad@wmail.go.th



"อุตสาหกรรมก้าวไกล ประสิทธิภาพก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ อก ๐๑๓๐(๑)/ ๕๖ ๙ ๑



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๕ สิงหาคม ๒๕๖๔

เรื่อง ยกเลิกบุคลากรและกรรมการบริษัทที่วิเคราะห

เรียน กรรมการผู้จัดการ บริษัท ยูนิค แอนาไลติก แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด

อ้างถึง คำขอรับใบอนุญาต/เปลี่ยนแปลงบุคลากร และขอคืนสถานะของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๙ พฤษภาคม ๒๕๖๔

ตามที่ขอรับอ้างถึง บริษัท ยูนิค แอนาไลติก แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด
ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๕๕ สถานที่ตั้งเลขที่ ๓ ซอยอุดมสุข ๕๑ ถนนสุขุมวิท
แขวงนางพญา เขตพระโขนง กรุงเทพมหานคร ขอคืนสถานะของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๙ พฤษภาคม ๒๕๖๔

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน
จำนวน ๕ ราย ได้แก่

- | | |
|------------------------|----------------------------|
| ๑) นายณัฏฐ์ พงษ์นิเวศ | ทะเบียนเลขที่ ๖-๑๕๕-๑-๐๐๐๔ |
| ๒) นายณัฏฐ์ ธรรมสุวรรณ | ทะเบียนเลขที่ ๖-๑๕๕-๑-๐๐๐๕ |
| ๓) นายอาทิตย์ งาม | ทะเบียนเลขที่ ๖-๑๕๕-๑-๐๐๐๖ |
| ๔) นางสาวณัฏฐา ปูนคำ | ทะเบียนเลขที่ ๖-๑๕๕-๑-๐๐๐๗ |
| ๕) นายวิโรจน์ แสงท้าว | ทะเบียนเลขที่ ๖-๑๕๕-๑-๐๐๐๘ |

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศิริ จันทะโร)
อธิบดีกรมโรงงานอุตสาหกรรม
ผู้อำนวยการศูนย์ส่งเสริมและพัฒนาคุณภาพ
ผู้ประกอบการและสนับสนุนผู้ประกอบการ

กองวิจัยและพัฒนาผลิตภัณฑ์โรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบผลิตภัณฑ์และทะเบียนห้องปฏิบัติการ

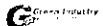
โทร. ๐ ๒๕๖๐ ๖๒๓๐ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๖๐ ๖๒๓๐ ต่อ ๒๑๐๔

ไปรษณีย์อิเล็กทรอนิกส์ sarabok@dwae.m.go.th



ดำเนินการถูกต้อง



"อุตสาหกรรมสีเขียว ประโยชน์ร่วมกัน รับผิดชอบต่อสังคม"



ที่ อก ๐๑๓๐(๑)/ ๕๖ ๙ ๑



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๐๗ กรกฎาคม ๒๕๖๔

เรื่อง เปลี่ยนแปลงบุคลากรและกรรมการบริษัทที่วิเคราะห

เรียน กรรมการผู้จัดการ บริษัท ยูนิค แอนาไลติก แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด

อ้างถึง คำขอรับใบอนุญาต/เปลี่ยนแปลงบุคลากร และขอคืนสถานะของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๙ พฤษภาคม ๒๕๖๔

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงบุคลากรและกรรมการบริษัทที่วิเคราะห
บริษัท ยูนิค แอนาไลติก แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด จำนวน ๒ แผ่น

ตามที่ขอรับอ้างถึง บริษัท ยูนิค แอนาไลติก แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด
ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๕๕ สถานที่ตั้งเลขที่ ๓ ซอยอุดมสุข ๕๑ ถนนสุขุมวิท
แขวงนางพญา เขตพระโขนง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากรและกรรมการบริษัทที่วิเคราะห
ความละเอียดดังนี้

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๓ ราย
- | | |
|-----------------------|----------------------------|
| ๑) นายณัฏฐ์ พงษ์นิเวศ | ทะเบียนเลขที่ ๖-๑๕๕-๑-๐๐๐๔ |
| ๒) นางสาวณัฏฐา ปูนคำ | ทะเบียนเลขที่ ๖-๑๕๕-๑-๐๐๐๗ |
| ๓) นางสาวณัฏฐา ปูนคำ | ทะเบียนเลขที่ ๖-๑๕๕-๑-๐๐๐๘ |
๒. ให้เพิ่มผู้ควบคุมห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๑ ราย
- | | |
|--------------------|----------------------------|
| นายณัฏฐ์ พงษ์นิเวศ | ทะเบียนเลขที่ ๖-๑๕๕-๑-๐๐๐๕ |
|--------------------|----------------------------|
๓. ให้เพิ่มข้อบัญญัติการวิเคราะห์ในน้ำดื่ม ยาเสพติด และดิน ตามที่ส่งมาด้วย
- อนึ่ง หนังสือแนบท้ายเอกสารแนบท้ายนี้ขอรับใบอนุญาต/เปลี่ยนแปลงห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒ กุมภาพันธ์ ๒๕๖๔

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศิริ จันทะโร)
อธิบดีกรมโรงงานอุตสาหกรรม
ผู้อำนวยการศูนย์ส่งเสริมและพัฒนาคุณภาพ
ผู้ประกอบการและสนับสนุนผู้ประกอบการ

กองวิจัยและพัฒนาผลิตภัณฑ์โรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบผลิตภัณฑ์และทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๕๖๐ ๖๒๓๐ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๖๐ ๖๒๓๐ ต่อ ๒๑๐๔

ไปรษณีย์อิเล็กทรอนิกส์ sarabok@dwae.m.go.th



ดำเนินการถูกต้อง



"อุตสาหกรรมสีเขียว ประโยชน์ร่วมกัน รับผิดชอบต่อสังคม"



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงบุคลากรและกรรมการบริษัทที่วิเคราะห

บริษัท ยูนิค แอนาไลติก แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด เลขทะเบียน ๖-๑๕๕

ที่ อก ๐๑๓๐(๑)/ ๕๖ ๙ ๑

ลงวันที่ ๐๗ กรกฎาคม ๒๕๖๔

ขอแนบส่งเอกสารแนบท้ายนี้ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๑๑ รายการ

น้ำดื่ม จำนวน ๔ รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Aluminum	Digestion, Inductively Coupled Plasma Method ⁽¹⁾
2	Copper	1) Digestion, Flame Atomic Absorption Spectrometric Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
3	Iron	1) Digestion, Flame Atomic Absorption Spectrometric Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
4	Molybdenum	Digestion, Inductively Coupled Plasma Method ⁽¹⁾

อากาศเสีย (ไม่ดัดแปลง) จำนวน ๑ รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Oxides of Nitrogen	Absorption Sampling, Ion Chromatographic Method ⁽¹⁾

ดิน จำนวน ๖ รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Aluminum	Digestion, Inductively Coupled Plasma Method ^(3,4)
2	Copper	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(3,4) 2) Digestion, Inductively Coupled Plasma Method ^(3,4)
3	Iron	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(3,4) 2) Digestion, Inductively Coupled Plasma Method ^(3,4)
4	Molybdenum	Digestion, Inductively Coupled Plasma Method ^(3,4)
5	pH	Electrometric Method ⁽¹⁾
6	TPH (C ₁₅ -C ₄)	Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(4,7)

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ดำเนินการถูกต้อง

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบผลิตภัณฑ์และทะเบียนห้องปฏิบัติการ การวิจัยและพัฒนาผลิตภัณฑ์โรงงาน กรมโรงงานอุตสาหกรรม โทร. ๐ ๒๕๖๐ ๖๒๓๐ ต่อ ๒๑๐๓-๕

เอกสารแนบท้ายหนังสือขอตรวจวิเคราะห์เป็นห้องปฏิบัติการวิเคราะห์เอกสาร
บริษัท ปูนซีเมนต์ แอนด์ เคมิคอล จำกัด ถนนจันทน์ เขตจตุจักร กรุงเทพมหานคร 10110
ที่ ๑๓๐๑(๑) / ๑๐๘๘ ลงวันที่ ๐๖ กุมภาพันธ์ ๒๕๖๕

ขอแจ้งการตรวจวิเคราะห์เป็นห้องปฏิบัติการวิเคราะห์เอกสาร จำนวน ๑๗ รายการ

น้ำดื่ม จำนวน ๕๖ รายการ

ลำดับ	สารเคมี	วิธีวิเคราะห์
1	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
2	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
3	Barium	Digestion, Inductively Coupled Plasma Method ⁽¹⁾
4	α-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
5	β-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
6	δ-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
7	γ-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
8	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method ⁽¹⁾ 2) 5-Day BOD Test, Membrane Electrode Method ⁽¹⁾
9	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
10	Chemical Oxygen Demand	1) Closed Reflux, Titrimetric Method ⁽¹⁾ 2) Closed Reflux, Colorimetric Method ⁽¹⁾ 3) Open Reflux, Titrimetric Method ⁽¹⁾
11	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
12	Chromium	1) Digestion, Direct Air-Acetylene Flame Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
13	Color	ADMI Weighted-Ordinate Spectrophotometric Method ⁽¹⁾
14	Copper	1) Digestion, Direct Air-Acetylene Flame Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
15	Cyanide	1) Distillation, Colorimetric Method ⁽¹⁾ 2) Total Cyanide after Distillation, by Flow Injection Analysis Method ⁽¹⁾
16	o,p'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
17	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
18	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
19	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
20	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
21	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
22	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
23	Endosulfan sulfate	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
24	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾

25 Endrin aldehyde...

ลำดับ	สารเคมี	วิธีวิเคราะห์
25	Endrin aldehyde	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
26	Formaldehyde	Distillation, Colorimetric Method ⁽¹⁾
27	Free Chlorine	1) Iodometric Method ⁽¹⁾ 2) DPD Ferrous Titrimetric Method ⁽¹⁾
28	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
29	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
30	Hexavalent Chromium	Colorimetric Method ⁽¹⁾
31	Lead	1) Digestion, Direct Air-Acetylene Flame Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
32	Manganese	1) Digestion, Direct Air-Acetylene Flame Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
33	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽¹⁾
34	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
35	Nickel	1) Digestion, Direct Air-Acetylene Flame Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
36	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method ⁽¹⁾ 2) Soxhlet Extraction Method ⁽¹⁾
37	pH	Electrometric Method ⁽¹⁾
38	Phenols	1) Distillation, Chloroform Extraction Method ⁽¹⁾ 2) Distillation, Direct Photometric Method ⁽¹⁾
39	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
40	Sulfide	1) Iodometric Method ⁽¹⁾ 2) Methylene Blue Method ⁽¹⁾
41	Temperature	Laboratory and Field Methods ⁽¹⁾
42	Total Dissolved Solids	Dried at 180 °C ⁽¹⁾
43	Total Kjeldahl Nitrogen	Semi-Micro-Kjeldahl Method ⁽¹⁾
44	Total Suspended Solids	Dried from 103 to 105 °C ⁽¹⁾
45	Trivalent Chromium	1) Digestion, Direct Air-Acetylene Flame Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
46	Zinc	1) Digestion, Direct Air-Acetylene Flame Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾

น้ำดื่ม...

น้ำดื่ม จำนวน 126 รายการ

ลำดับ	สารเคมี	วิธีวิเคราะห์
1	Acenaphthene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
2	Acetone	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
3	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
4	Anthracene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
5	Antimony	Digestion, Inductively Coupled Plasma Method ⁽¹⁾
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
8	Barium	Digestion, Inductively Coupled Plasma Method ⁽¹⁾
9	Benz(a)anthracene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
10	Benzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
11	Benzo(b)fluoranthene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
12	Benzo(k)fluoranthene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
13	Benzic acid	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾

14 Benz(a)pyrene...

ลำดับ	สารเคมี	วิธีวิเคราะห์
14	Benz(a)pyrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
15	Benz(b)fluoranthene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
16	Beryllium	Digestion, Inductively Coupled Plasma Method ⁽¹⁾
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
19	Bromodichloromethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
20	Bromoform	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
21	Butanol	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
23	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method ⁽¹⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽¹⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
25	Carbon disulfide	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
26	Carbon tetrachloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
27	Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾

29 Chlorobenzene...

ลำดับ	สารเคมี	วิธีวิเคราะห์
29	Chlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
30	Chlorodibromomethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽²⁾
31	Chloroform	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
33	Chromium	1) Digestion, Direct Air-Acetylene Flame Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
34	Chromium (III)	1) Digestion, Direct Air-Acetylene Flame Method; Colorimetric Method; Calculation ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ⁽¹⁾
35	Chromium (VI)	Colorimetric Method ⁽¹⁾
36	Chrysene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
37	Cyanide	Distillation, Colorimetric Method ⁽¹⁾
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
39	DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
40	DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
41	DDT	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
42	Dibenz(a,h)anthracene	1) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾

43 Di-n-butyl phthalate...

ลำดับ	สารเคมี	วิธีวิเคราะห์
43	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
44	1,2-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
45	1,3-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
46	1,4-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
47	3,3'-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
48	1,1-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
49	1,2-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
50	1,1-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
51	cis-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
52	trans-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
54	1,2-Dichloropropane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
55	1,3-Dichloropropane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
56	1,3-Dichloropropene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
57	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
58	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾

61 2,4-Dinitrotoluene...

ลำดับ	สารเคมี	วิธีวิเคราะห์
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
63	Di-n-Octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
64	Endosulfan	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
65	Endrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
66	Ethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
67	Fluoranthene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
68	Fluorene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
69	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
70	Heptachlor epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
72	Hexachloro-1,3-butadiene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
73	n-Hexane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾

74 α-HCH...

ลำดับ	สารเคมี	วิธีวิเคราะห์
74	α-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
75	β-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
76	γ-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
79	Indeno(1,2,3-cd)pyrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
81	Lead	1) Digestion, Direct Air-Acetylene Flame Method ⁽¹⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽¹⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
82	Manganese	1) Digestion, Direct Air-Acetylene Flame Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
83	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽¹⁾
84	Methanol	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
85	Methoxychlor	1) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾
86	Methyl bromide	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾

87 Methylene chloride...

ลำดับ	สารเคมี	วิธีการตรวจ
87	Methylene chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
89	2-Methylnaphthalene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
90	Methyl tert-butyl ether	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
91	Naphthalene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
92	Nickel	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
95	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB-1242 - PCB-1248 - PCB-1254 - PCB-1260	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
98	pH	Electrometric Method ⁽⁴⁾
99	Phenanthrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾

100 Phenol...

ลำดับ	สารเคมี	วิธีการตรวจ
100	Phenol	1) Distillation, Chloroform Extraction Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
101	Pyrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
102	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
103	Silver	Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
104	Styrene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
105	1,1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
106	Tetrachloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
107	Toluene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
108	Toxaphene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
109	TPH (C ₅ - C ₆)	1) Purge and Trap, Gas Chromatographic Method ^(12,24) 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(12,24)
110	TPH (C _{5,6} - C ₁₀)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(2,25)
111	TPH (C _{5,6} - C ₁₃)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(2,25)
112	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
113	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
114	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
115	Trichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾

116 2,4,5-Trichlorophenol...

ลำดับ	สารเคมี	วิธีการตรวจ
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
118	1,3,5-Trimethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
119	Vanadium	Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
120	Vinyl acetate	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
121	Vinyl chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
122	m-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
123	o-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
124	p-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
125	Xylene (Total)	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
126	Zinc	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾

อากาศเสีย (ปล่อยระบาย) จำนวน 25 รายการ

ลำดับ	สารเคมี	วิธีการตรวจ
1	Antimony	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
2	Arsenic	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
3	Cadmium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
4	Carbon Monoxide	Instrumental Analyzer Method ⁽³⁾
5	Chlorine	Isokinetic Sampling, Ion Chromatographic Method ⁽³⁾
6	Chromium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽⁵⁾

Chromium (ตบ)...

ลำดับ	สารเคมี	วิธีการตรวจ
6	Chromium (ตบ)	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
7	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
8	Copper	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
9	Cresol	Absorption Sampling, Gas Chromatographic Method ⁽⁵⁾
10	Dioxins/Furans	Isokinetic Sampling ⁽⁵⁾
11	Hydrogen Chloride	Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
12	Hydrogen Fluoride	Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
13	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ⁽⁵⁾
14	Lead	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
15	Manganese	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
16	Mercury	Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁵⁾
17	Nickel	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
18	Opacity	Ringelmann's Method ⁽¹⁾
19	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic acid Method ⁽²³⁾ 2) Instrumental Analyzer Method ⁽³⁾
20	Selenium	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
21	Sulfur Dioxide	1) Absorption Sampling, Barium-Thoron Titrimetric Method ⁽³⁾
22	Sulfuric Acid	2) Instrumental Analyzer Method ⁽³⁾ Isokinetic Sampling, Barium-Thoron Titrimetric Method ⁽³⁾

23 Total Suspended Particulate...

ลำดับ	สารมลพิษ	วิธีวิเคราะห์
23	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^(3.2.2)
24	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^(3.4.1)
25	Xylene	1) Bag Sampling, Gas Chromatographic Method ^(3.3.2) 2) Adsorption Sampling, Gas Chromatographic Method ^(3.3.3)

คุณสมบัติของตัวแก้ไข จำนวน 35 รายการ

ลำดับ	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3.3.2) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(3.3.3)
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3.4.1) 2) Digestion, Inductively Coupled Plasma Method ^(7.1.4)
3	Arsenic	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^(3.4.1) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3.4.1) 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^(7.1.4) 4) Digestion, Inductively Coupled Plasma Method ^(7.1.4)
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3.4.1) 2) Digestion, Inductively Coupled Plasma Method ^(7.1.4)
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3.4.1) 2) Digestion, Inductively Coupled Plasma Method ^(7.1.4)
6	Cadmium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(3.4.1) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3.4.1) 3) Digestion, Flame Atomic Absorption Spectrometric Method ^(7.1.4) 4) Digestion, Inductively Coupled Plasma Method ^(7.1.4)
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3.3.2) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(3.3.3)

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ลำดับ	สารมลพิษ	วิธีวิเคราะห์
8	Chromium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(3.4.1) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3.4.1) 3) Digestion, Flame Atomic Absorption Spectrometric Method ^(7.1.4) 4) Digestion, Inductively Coupled Plasma Method ^(7.1.4)
9	Chromium (III)	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation ^(3.4.1) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation ^(3.4.1) 3) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation ^(7.1.4) 4) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation ^(7.1.4)
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^(3.4.1) 2) Alkaline Digestion, Colorimetric Method ^(3.4.1)
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3.4.1) 2) Digestion, Inductively Coupled Plasma Method ^(7.1.4)
12	Copper	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(3.4.1) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3.4.1) 3) Digestion, Flame Atomic Absorption Spectrometric Method ^(7.1.4) 4) Digestion, Inductively Coupled Plasma Method ^(7.1.4)
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3.3.2) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(3.3.3)
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3.3.2) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(3.3.3)

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ลำดับ	สารมลพิษ	วิธีวิเคราะห์
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3.3.2) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(3.3.3)
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3.3.2) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(3.3.3)
17	Dieldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3.3.2) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(3.3.3)
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3.3.2) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(3.3.3)
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3.3.2) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(3.3.3)
20	Lead	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(3.4.1) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3.4.1) 3) Digestion, Flame Atomic Absorption Spectrometric Method ^(7.1.4) 4) Digestion, Inductively Coupled Plasma Method ^(7.1.4)
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3.3.2) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(3.3.3)
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(3.4.1) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3.4.1) 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(7.1.4) 4) Digestion, Inductively Coupled Plasma Method ^(7.1.4)

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ลำดับ	สารมลพิษ	วิธีวิเคราะห์
22	Mercury (Hg)	5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ^(3.4.1)
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3.3.2) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(3.3.3)
24	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3.4.1) 2) Digestion, Inductively Coupled Plasma Method ^(7.1.4)
25	Nickel	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(3.4.1) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3.4.1) 3) Digestion, Flame Atomic Absorption Spectrometric Method ^(7.1.4) 4) Digestion, Inductively Coupled Plasma Method ^(7.1.4)
26	Polychlorinated Biphenyls - Aroclor 1016 - Aroclor 1201 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,3-Dichlorobiphenyl - 2,2',5'-Trichlorobiphenyl - 2,4',5'-Trichlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4,4',5-Pentachlorobiphenyl	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3.3.2) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(3.3.3)

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ลำดับ	สารเคมี	วิธีวิเคราะห์
27	Polychlorinated Biphenyls(พีบี) - 2,2',3,4,4',5'- Hexachlorobiphenyl - 2,2',3,4,5,5'- Hexachlorobiphenyl - 2,2',3,5,5',6'- Hexachlorobiphenyl - 2,2',4,4',5,5'- Hexachlorobiphenyl - 2,2',3,3',4,4',5'- Heptachlorobiphenyl - 2,2',3,4,4',5,5'- Heptachlorobiphenyl - 2,2',3,4,4',5',6'- Heptachlorobiphenyl - 2,2',3,4',5,5',6'- Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6'- Nonachlorobiphenyl Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(9,23) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21) Electrometric Method ^(11,21) 3) Waste Extraction, Digestion, Hydride Generation/ Atomic Absorption Spectrometric Method ^(3,4,21) 4) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,4,14) 5) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^(2,21) 6) Digestion, Inductively Coupled Plasma Method ^(7,14) 7) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,4,14) 8) Digestion, Inductively Coupled Plasma Method ^(7,14) 9) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,4,14) 10) Digestion, Inductively Coupled Plasma Method ^(7,14) 11) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,4,14) 12) Digestion, Inductively Coupled Plasma Method ^(7,14)
28	pH	
29	Selenium	1) Waste Extraction, Digestion, Hydride Generation/ Atomic Absorption Spectrometric Method ^(3,4,21) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,4,14) 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^(2,21) 4) Digestion, Inductively Coupled Plasma Method ^(7,14)
30	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,4,14) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)
31	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,4,14) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)

32 Toxaphene...

ลำดับ	สารเคมี	วิธีวิเคราะห์
32	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(9,23) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(10,21)
33	Trichloroethylene	1) Waste Extraction, Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(8,12,21) 2) Waste Extraction, Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(8,11,21) 3) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(12,21) 4) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,21)
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(4,14) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)
35	Zinc	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(4,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,4,14) 3) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 4) Digestion, Inductively Coupled Plasma Method ^(7,14)

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ลำดับ	สารเคมี	วิธีวิเคราะห์
1	Acenaphthene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,21) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
2	Acetone	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,21)
3	Aldrin	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,21) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
4	Anthracene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,21)

Anthracene (พีบี)...

ลำดับ	สารเคมี	วิธีวิเคราะห์
4	Anthracene (พีบี)	2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
5	Antimony	Digestion, Inductively Coupled Plasma Method ^(13,14)
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^(7,14) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)
7	Atrazine	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
8	Barium	Digestion, Inductively Coupled Plasma Method ^(7,14)
9	Benz(a)anthracene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,21) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
10	Benzene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,21) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,21)
11	Benzo(b)fluoranthene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,21) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
12	Benzo(k)fluoranthene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,21) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
13	Benzoic acid	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
14	Benzo(a)pyrene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,21) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
15	Benzo(g,h,i)perylene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,21) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
16	Beryllium	Digestion, Inductively Coupled Plasma Method ^(7,14)

17 Bis(2-chloroethoxy)ether...

ลำดับ	สารเคมี	วิธีวิเคราะห์
17	Bis(2-chloroethoxy)ether	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
18	Bis(2-ethoxy)phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,21)
20	Bromoform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,21)
21	Butanol	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,21)
22	Butyl benzyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
23	Cadmium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)
24	Carbazole	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,21)
26	Carbon tetrachloride	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,21) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,21)
27	Chlordane	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,21) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
28	p-Chloroaniline	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,21)
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,21)
31	Chloroform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,21)
32	2-Chlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,21)

33 Chromium...

ลำดับ	สารเคมี	วิธีการตรวจ
33	Chromium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(1,15) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)
34	Chromium (III)	1) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation ^(7,15,17) 2) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation ^(7,15,17)
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^(8,17)
36	Chrysene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
37	Cyanide	Extraction, Distillation, Colorimetric Method ^(9,30)
38	2,4-D	Ultrasonic Extraction, Gas Chromatographic Method ⁽²⁴⁾
39	DOD	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
40	DDE	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
41	DDT	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
42	Dibenz[a,h]anthracene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
43	Di-n-butyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,27)

45 1,3-Dichlorobenzene...

ลำดับ	สารเคมี	วิธีการตรวจ
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
47	3,3'-Dichlorobenzidine	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
48	1,1-Dichloroethane	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
49	1,2-Dichloroethane	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
50	1,1-Dichloroethylene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
51	cis-1,2-Dichloroethylene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
52	trans-1,2-Dichloroethylene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
53	2,4-Dichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
57	Dieldrin	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)

58 Diethyl phthalate...

ลำดับ	สารเคมี	วิธีการตรวจ
58	Diethyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
59	2,4-Dimethylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
60	2,4-Dinitrophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
61	2,4-Dinitrotoluene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
62	2,6-Dinitrotoluene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
63	Di-n-Octyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
64	Endosulfan	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
65	Endrin	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
66	Ethylbenzene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
67	Fluoranthene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
68	Fluorene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
69	Heptachlor	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
70	Heptachlor epoxide	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28)

Heptachlor epoxide (คป)...
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ลำดับ	สารเคมี	วิธีการตรวจ
70	Heptachlor epoxide (คป)	2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
71	Hexachlorobenzene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
73	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
74	α-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
75	β-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
76	γ-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
77	Hexachlorocyclopentadiene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
78	Hexachloroethane	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
79	Indeno(1,2,3-cd)pyrene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
80	Isophorone	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
81	Lead	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)
82	Manganese	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)

83 Mercury...

Polychlorinated Biphenyls(PCB)....97 Pentachlorophenol..111 1,2,4-Trichlorobenzene ..125 Zinc.

ลำดับ	สารเคมี	วิธีการตรวจ
125	Zinc	1) Digestion, Flame Atomic Absorption Spectrometric Method ⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁴⁾

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