

ภาคผนวก ค

รายงานผลการติดตามตรวจสอบคุณภาพน้ำทิ้ง



รายงานผลการติดตามตรวจสอบคุณภาพน้ำทิ้ง  
เดือนมกราคม พ.ศ. 2568



## ANALYSIS REPORT

**CUSTOMER NAME** : HIVE SUKHUMVIT 65  
**ADDRESS** : 9/125 SOI SUKHUMVIT 65 PHRA KHANONG NUEA WATTHANA BANGKOK 10110  
**CONTACT INFORMATION** : TEL : 06 5607 0044 e-mail : Hive\_65125@hotmail.com  
**SAMPLING SOURCE** : -  
**SAMPLE TYPE** : WASTEWATER  
**SAMPLING DATE** : JANUARY 16, 2025  
**SAMPLING TIME** : 14:45 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR KRIDSANAPONG NAMTHIP  
**ANALYZED BY** : MISS ARIYA THARAROM

**RECEIVED DATE** : JANUARY 16, 2025  
**ANALYTICAL DATE** : JANUARY 16-22, 2025  
**ISSUE DATE** : JANUARY 27, 2025  
**REPORT NO.** : 2025-U006508  
**WORK NO.** : 2024-011374  
**ANALYSIS NO.** : T25AA928-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			ส่วนแยกภาค เก็บตะกอน T25AA928-0001		
pH <sup>a</sup>	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H <sup>+</sup> B AND 1060 B	7.0 (28.0°C)	-	-
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	160	-	2.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: PART 2540 D)	4,111	-	5.0
SULPHIDE <sup>b</sup>	mg/L	IODOMETRIC METHOD (SM: PART 4500-S <sub>2</sub> F)	2.7	-	0.50
TOTAL KJELDAHL NITROGEN <sup>b</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	112	1.5	5.0
OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	92	-	3
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	0.1	-
<b>MICROBIOLOGY</b>					
COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	>160,000	1.8	-
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			BROWN/TURBID BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24<sup>th</sup> EDITION, 2023.

ND : NOT DETECTED.

(MISS WILAILAK SRISUK)  
LABORATORY SUPERVISOR



## ANALYSIS REPORT

<b>CUSTOMER NAME</b>	: HIVE SUKHUMVIT 65	<b>RECEIVED DATE</b>	: JANUARY 16, 2025
<b>ADDRESS</b>	: 9/125 SOI SUKHUMVIT 65 PHRA KHANONG NUEA WATTHANA BANGKOK 10110	<b>ANALYTICAL DATE</b>	: JANUARY 16-22, 2025
<b>CONTACT INFORMATION</b>	: TEL : 06 5607 0044 e-mail : Hive_65125@hotmail.com	<b>ISSUE DATE</b>	: JANUARY 27, 2025
<b>SAMPLING SOURCE</b>	: -	<b>REPORT NO.</b>	: 2025-U006509
<b>SAMPLE TYPE</b>	: EFFLUENT	<b>WORK NO.</b>	: 2024-011374
<b>SAMPLING DATE</b>	: JANUARY 16, 2025	<b>ANALYSIS NO.</b>	: T25AA928-0002
<b>SAMPLING TIME</b>	: 14:40 HOUR		
<b>SAMPLING METHOD</b>	: GRAB		
<b>SAMPLING BY</b>	: MR KRIDSANAPONG NAMTHIP		
<b>ANALYZED BY</b>	: MISS ARIYA THARAROM		

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			ส่งเก็บน้ำใช้ T25AA928-0002			
pH <sup>a</sup>	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H* B AND 1060 B	6.5 (29.3°C)	5.5-9.0	-	-
BIOCHEMICAL OXYGEN DEMAND* <sup>c</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	6.4	≤ 30	-	2.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: PART 2540 D)	17.5	≤ 40	-	5.0
SULPHIDE <sup>b</sup>	mg/L	IODOMETRIC METHOD (SM: PART 4500-S <sup>2</sup> -F)	< 0.50	≤ 1.0	-	0.50
TOTAL KJELDAHL NITROGEN <sup>b</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	13.1	≤ 35	1.5	5.0
OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	< 3	≤ 20	-	3
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	-	0.1	-
<b>MICROBIOLOGY</b>						
COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	160,000	-	1.8	-
<b>SAMPLE CONDITION</b>						
WATER'S COLOUR/TURBID			YELLOW/TURBID			
SEDIMENT			BROWN			

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24<sup>th</sup> EDITION, 2023.

REGULATORY STANDARD : RANGE OR MAXIMUM PERMITTED VALUE FOR BUILDING EFFLUENT STANDARDS CLASS B, NOTIFICATION OF THE MINISTRY OF RESOURCES AND ENVIRONMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 141, PART 233 D, DATED AUGUST 27, 2024.

\* : ADDITION OF NITRIFICATION INHIBITION (TCMP) FOLLOW TO THE SM: 5210B.5(e).

ND : NOT DETECTED.

(MISS WILAILAK SRISUK)  
LABORATORY SUPERVISOR



รายงานผลการติดตามตรวจสอบคุณภาพน้ำทิ้ง  
เดือนกุมภาพันธ์ พ.ศ. 2568



## ANALYSIS REPORT

**CUSTOMER NAME** : HIVE SUKHUMVIT 65  
**ADDRESS** : 9/125 SOI SUKHUMVIT 65 PHRA KHANONG NUEA WATTHANA BANGKOK 10110  
**CONTACT INFORMATION** : TEL : 06 5607 0044 e-mail : Hive\_65125@hotmail.com  
**SAMPLING SOURCE** : -  
**SAMPLE TYPE** : WASTEWATER  
**SAMPLING DATE** : FEBRUARY 28, 2025  
**SAMPLING TIME** : 16:20 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR SOMCHART UTHUMRAT  
**ANALYZED BY** : MISS ARIYA THARAROM

**RECEIVED DATE** : FEBRUARY 28, 2025  
**ANALYTICAL DATE** : FEBRUARY 28 - MARCH 6, 2025  
**ISSUE DATE** : MARCH 11, 2025  
**REPORT NO.** : 2025-U020139  
**WORK NO.** : 2024-011374  
**ANALYSIS NO.** : T25AE332-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			ส่วนแยกภาค-เก็บตะกอน T25AE332-0001		
pH <sup>a</sup>	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H <sup>+</sup> B AND 1060 B	6.8 (30.1°C)	-	-
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	166	-	2.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: PART 2540 D)	897	-	5.0
SULPHIDE <sup>b</sup>	mg/L	IODOMETRIC METHOD (SM: PART 4500-S <sup>2-</sup> F)	< 0.50	-	0.50
TOTAL KJELDAHL NITROGEN <sup>b</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	76.7	1.5	5.0
OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	13	-	3
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	0.1	-
<b>MICROBIOLOGY</b>					
COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	>160,000	1.8	-
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID SEDIMENT			BROWN/TURBID BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT NOT IN SCOPE OF ACCREDITATION

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24<sup>th</sup> EDITION, 2023.

ND : NOT DETECTED.

(MISS WILAILAK SRISUK)  
LABORATORY SUPERVISOR



## ANALYSIS REPORT

**CUSTOMER NAME** : HIVE SUKHUMVIT 65  
**ADDRESS** : 9/125 SOI SUKHUMVIT 65 PHRA KHANONG NUEA WATTHANA BANGKOK 10110  
**CONTACT INFORMATION** : TEL : 06 5607 0044 e-mail : Hive\_65125@hotmail.com  
**SAMPLING SOURCE** : -  
**SAMPLE TYPE** : EFFLUENT  
**SAMPLING DATE** : FEBRUARY 28, 2025  
**SAMPLING TIME** : 16:30 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR SOMCHART UTHUMRAT  
**ANALYZED BY** : MISS ARIYA THARAROM

**RECEIVED DATE** : FEBRUARY 28, 2025  
**ANALYTICAL DATE** : FEBRUARY 28 - MARCH 6, 2025  
**ISSUE DATE** : MARCH 11, 2025  
**REPORT NO.** : 2025-U020144  
**WORK NO.** : 2024-011374  
**ANALYSIS NO.** : T25AE332-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			ถังเก็บน้ำใส T25AE332-0002			
pH <sup>a</sup>	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H <sup>+</sup> B AND 1060 B	6.3 (30.8°C)	5.5-9.0	-	-
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	6.4	≤ 30	-	2.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: PART 2540 D)	23.1	≤ 40	-	5.0
SULPHIDE <sup>b</sup>	mg/L	IODOMETRIC METHOD (SM: PART 4500 -S <sup>2-</sup> F)	< 0.50	≤ 1.0	-	0.50
TOTAL KJELDAHL NITROGEN <sup>b</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	18.0	≤ 35	1.5	5.0
OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	< 3	≤ 20	-	3
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	-	0.1	-
<b>MICROBIOLOGY</b>						
COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	>160,000	-	1.8	-
<b>SAMPLE CONDITION</b>						
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/TURBID BROWN			

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT NOT IN SCOPE OF ACCREDITATION

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24<sup>th</sup> EDITION, 2023.

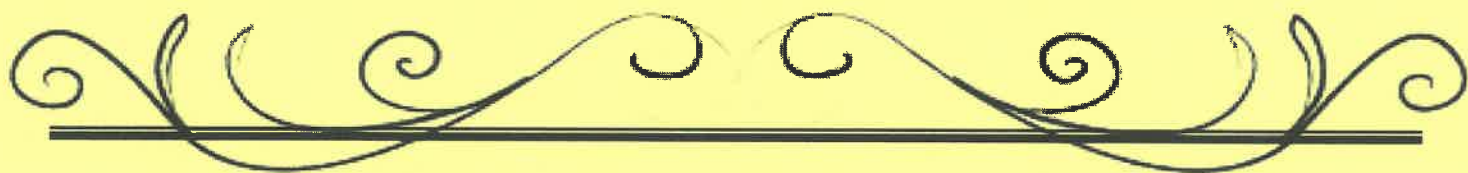
REGULATORY STANDARD : RANGE OR MAXIMUM PERMITTED VALUE FOR BUILDING EFFLUENT STANDARDS CLASS B, NOTIFICATION OF THE MINISTRY OF RESOURCES AND ENVIRONMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 141, PART 233 D, DATED AUGUST 27, 2024.

ND : NOT DETECTED.

(MISS WILAILAK SRISUK)  
LABORATORY SUPERVISOR



รายงานผลการติดตามตรวจสอบคุณภาพน้ำทิ้ง  
เดือนมีนาคม พ.ศ. 2568



## ANALYSIS REPORT

**CUSTOMER NAME** : HIVE SUKHUMVIT 65  
**ADDRESS** : 9/125 SOI SUKHUMVIT 65 PHRA KHANONG NUEA WATTHANA BANGKOK 10110  
**CONTACT INFORMATION** : TEL : 06 5607 0044 e-mail : Hive\_65125@hotmail.com  
**SAMPLING SOURCE** : -  
**SAMPLE TYPE** : WASTEWATER  
**SAMPLING DATE** : MARCH 28, 2025  
**SAMPLING TIME** : 11:30 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR WEERAYUT MOKKAEW  
**ANALYZED BY** : MISS ARIYA THARAROM

**RECEIVED DATE** : MARCH 28, 2025  
**ANALYTICAL DATE** : MARCH 28 - APRIL 8, 2025  
**ISSUE DATE** : APRIL 10, 2025  
**REPORT NO.** : 2025-U030471  
**WORK NO.** : 2024-011374  
**ANALYSIS NO.** : T25AG779-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			ส่วนแยกภาค-เก็บตะกอน T25AG779-0001		
pH <sup>a</sup>	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H <sup>+</sup> B AND 1060 B	6.7 (29.9°C)	-	-
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	86.8	-	2.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: PART 2540 D)	104	-	5.0
SULPHIDE <sup>b</sup>	mg/L	IODOMETRIC METHOD (SM: PART 4500-S <sup>2-</sup> F)	3.0	-	0.50
TOTAL KJELDAHL NITROGEN <sup>b</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	74.1	1.5	5.0
OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	7	-	3
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	0.1	-
MICROBIOLOGY					
COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	>160,000	1.8	-
SAMPLE CONDITION					
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/TURBID BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT NOT IN SCOPE OF ACCREDITATION

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24<sup>th</sup> EDITION, 2023.

ND : NOT DETECTED.

(MRS PIYAPAT SUTTAMANUTWONG)  
LABORATORY SUPERVISOR



## ANALYSIS REPORT

**CUSTOMER NAME** : HIVE SUKHUMVIT 65  
**ADDRESS** : 9/125 SOI SUKHUMVIT 65 PHRA KHANONG NUEA WATTHANA BANGKOK 10110  
**CONTACT INFORMATION** : TEL : 06 5607 0044 e-mail : Hive\_65125@hotmail.com  
**SAMPLING SOURCE** : -  
**SAMPLE TYPE** : EFFLUENT  
**SAMPLING DATE** : MARCH 28, 2025  
**SAMPLING TIME** : 11:25 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR WEERAYUT MOKKAEW  
**ANALYZED BY** : MISS ARIYA THARAROM

**RECEIVED DATE** : MARCH 28, 2025  
**ANALYTICAL DATE** : MARCH 28 - APRIL 8, 2025  
**ISSUE DATE** : APRIL 10, 2025  
**REPORT NO.** : 2025-U030472  
**WORK NO.** : 2024-011374  
**ANALYSIS NO.** : T25AG779-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			ส่งเก็บน้ำใน T25AG779-0002			
pH <sup>a</sup>	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H <sup>+</sup> B AND 1060 B	6.3 (31.4°C)	5.5-9.0	-	-
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	6.2	≤ 30	-	2.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: PART 2540 D)	24.1	≤ 40	-	5.0
SULPHIDE <sup>b</sup>	mg/L	IODOMETRIC METHOD (SM: PART 4500 -S <sup>2-</sup> F)	< 0.50	≤ 1.0	-	0.50
TOTAL KJELDAHL NITROGEN <sup>b</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	13.6	≤ 35	1.5	5.0
OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	< 3	≤ 20	-	3
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	-	0.1	-
<b>MICROBIOLOGY</b>						
COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	330	-	1.8	-
<b>SAMPLE CONDITION</b>						
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/TURBID BROWN			

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT NOT IN SCOPE OF ACCREDITATION

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24<sup>th</sup> EDITION, 2023.

REGULATORY STANDARD : RANGE OR MAXIMUM PERMITTED VALUE FOR BUILDING EFFLUENT STANDARDS CLASS B, NOTIFICATION OF THE MINISTRY OF RESOURCES AND ENVIRONMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 141, PART 233 D, DATED AUGUST 27, 2024.

ND : NOT DETECTED.

(MRS PIYAPAT SUTTAMANUTWONG)  
LABORATORY SUPERVISOR



รายงานผลการติดตามตรวจสอบคุณภาพน้ำทิ้ง  
เดือนเมษายน พ.ศ. 2568



## ANALYSIS REPORT

**CUSTOMER NAME** : HIVE SUKHUMVIT 65  
**ADDRESS** : 9/125 SOI SUKHUMVIT 65 PHRA KHANONG NUEA WATTHANA BANGKOK 10110  
**CONTACT INFORMATION** : TEL : 06 5607 0044 e-mail : Hive\_65125@hotmail.com  
**SAMPLING SOURCE** : -  
**SAMPLE TYPE** : WASTEWATER  
**SAMPLING DATE** : APRIL 29, 2025  
**SAMPLING TIME** : 15:50 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR RONNAYUT PRATHUMKET  
**ANALYZED BY** : MISS ARIYA THARAROM  
**RECEIVED DATE** : APRIL 29, 2025  
**ANALYTICAL DATE** : APRIL 29 - MAY 8, 2025  
**ISSUE DATE** : MAY 13, 2025  
**REPORT NO.** : 2025-U040552  
**WORK NO.** : 2024-011374  
**ANALYSIS NO.** : T25AJ164-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			ส่วนแยกภาค-เก็บตะกอน T25AJ164-0001		
pH <sup>a</sup>	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H <sup>+</sup> B AND 1060 B	7.4 (31.4°C)	-	-
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	136	-	2.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: PART 2540 D)	212	-	5.0
SULPHIDE <sup>b</sup>	mg/L	IODOMETRIC METHOD (SM: PART 4500-S <sup>2-</sup> F)	1.7	-	0.50
TOTAL KJELDAHL NITROGEN <sup>b</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	73.5	1.5	5.0
OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	8	-	3
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	0.1	-
<b>MICROBIOLOGY</b>					
TOTAL COLIFORMS <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	>160,000	1.8	-
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID			YELLOW/TURBID		
SEDIMENT			BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT NOT IN SCOPE OF ACCREDITATION

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24<sup>th</sup> EDITION, 2023.

ND : NOT DETECTED.

(MRS PIYAPAT SUTTAMANUTWONG)  
LABORATORY SUPERVISOR



## ANALYSIS REPORT

**CUSTOMER NAME** : HIVE SUKHUMVIT 65  
**ADDRESS** : 9/125 SOI SUKHUMVIT 65 PHRA KHANONG NUEA WATTHANA BANGKOK 10110  
**CONTACT INFORMATION** : TEL : 06 5607 0044 e-mail : Hive\_65125@hotmail.com  
**SAMPLING SOURCE** : -  
**SAMPLE TYPE** : EFFLUENT  
**SAMPLING DATE** : APRIL 29, 2025  
**SAMPLING TIME** : 15:40 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR RONNAYUT PRATHUMKET  
**ANALYZED BY** : MISS ARIYA THARAROM

**RECEIVED DATE** : APRIL 29, 2025  
**ANALYTICAL DATE** : APRIL 29 - MAY 8, 2025  
**ISSUE DATE** : MAY 13, 2025  
**REPORT NO.** : 2025-U040557  
**WORK NO.** : 2024-011374  
**ANALYSIS NO.** : T25AJ164-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			ส่งเก็บน้ำใส T25AJ164-0002			
pH <sup>a</sup>	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H <sup>+</sup> B AND 1060 B	7.1 (33.0°C)	5.5-9.0	-	-
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	22.0	≤ 30	-	2.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: PART 2540 D)	14.0	≤ 40	-	5.0
SULPHIDE <sup>b</sup>	mg/L	IODOMETRIC METHOD (SM: PART 4500 -S <sup>2-</sup> F)	< 0.50	≤ 1.0	-	0.50
TOTAL KJELDAHL NITROGEN <sup>b</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	11.1	≤ 35	1.5	5.0
OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	< 3	≤ 20	-	3
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	-	0.1	-
MICROBIOLOGY						
TOTAL COLIFORMS <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	1,700	-	1.8	-
<b>SAMPLE CONDITION</b>						
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/TURBID BROWN			

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT NOT IN SCOPE OF ACCREDITATION

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24<sup>th</sup> EDITION, 2023.

REGULATORY STANDARD : RANGE OR MAXIMUM PERMITTED VALUE FOR BUILDING EFFLUENT STANDARDS CLASS B, NOTIFICATION OF THE MINISTRY OF RESOURCES AND ENVIRONMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 141, PART 233 D, DATED AUGUST 27, 2024.

ND : NOT DETECTED.

(MRS PIYAPAT SUTTAMANUTWONG)  
LABORATORY SUPERVISOR



รายงานผลการติดตามตรวจสอบคุณภาพน้ำทิ้ง  
เดือนพฤษภาคม พ.ศ. 2568



## ANALYSIS REPORT

**CUSTOMER NAME** : HIVE SUKHUMVIT 65  
**ADDRESS** : 9/125 SOI SUKHUMVIT 65 PHRA KHANONG NUEA WATTHANA BANGKOK 10110  
**CONTACT INFORMATION** : TEL : 06 5607 0044 e-mail : Hive\_65125@hotmail.com  
**SAMPLING SOURCE** : -  
**SAMPLE TYPE** : WASTEWATER  
**SAMPLING DATE** : MAY 26, 2025  
**SAMPLING TIME** : 15:50 HOUR  
**SAMPLING METHOD** : GRAB, GRAB AND STERILE TECHNIQUE  
**SAMPLING BY** : MR TONNAM SANGNAKHON  
**ANALYZED BY** : MISS ARIYA THARAROM  
**RECEIVED DATE** : MAY 26, 2025  
**ANALYTICAL DATE** : MAY 26 - JUNE 2, 2025  
**ISSUE DATE** : JUNE 9, 2025  
**REPORT NO.** : 2025-U049918  
**WORK NO.** : 2024-011374  
**ANALYSIS NO.** : T25AL300-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			ส่วนแยกการเก็บตะกอน T25AL300-0001		
pH <sup>c</sup>	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H <sup>+</sup> B AND 1060 B	7.9 (30.5°C)	-	-
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	103	-	2.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED FROM 103 TO 105 °C (SM: PART 2540 D)	96.8	-	5.0
SULPHIDE <sup>c</sup>	mg/L	IODOMETRIC METHOD (SM: PART 4500-S <sup>2</sup> -F)	3.1	-	0.50
TOTAL KJELDAHL NITROGEN <sup>b</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	18.1	1.5	5.0
OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	12	-	3
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	0.1	-
<b>MICROBIOLOGY</b>					
TOTAL COLIFORMS <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	>160,000	1.8	-
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID			YELLOW/TURBID		
SEDIMENT			BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT NOT IN SCOPE OF ACCREDITATION

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24<sup>th</sup> EDITION, 2023.

ND : NOT DETECTED.

(MRS PIYAPAT SUTTAMANUTWONG)  
LABORATORY SUPERVISOR



## ANALYSIS REPORT

**CUSTOMER NAME** : HIVE SUKHUMVIT 65  
**ADDRESS** : 9/125 SOI SUKHUMVIT 65 PHRA KHANONG NUEA WATTHANA BANGKOK 10110  
**CONTACT INFORMATION** : TEL : 06 5607 0044 e-mail : Hive\_65125@hotmail.com  
**SAMPLING SOURCE** : -  
**SAMPLE TYPE** : EFFLUENT  
**SAMPLING DATE** : MAY 26, 2025  
**SAMPLING TIME** : 15:40 HOUR  
**SAMPLING METHOD** : GRAB, GRAB AND STERILE TECHNIQUE  
**SAMPLING BY** : MR TONNAM SANGNAKHON  
**ANALYZED BY** : MISS ARIYA THARAROM  
**RECEIVED DATE** : MAY 26, 2025  
**ANALYTICAL DATE** : MAY 26 - JUNE 2, 2025  
**ISSUE DATE** : JUNE 9, 2025  
**REPORT NO.** : 2025-U049919  
**WORK NO.** : 2024-011374  
**ANALYSIS NO.** : T25AL300-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			ดังเก็บน้ำใน T25AL300-0002			
pH <sup>c</sup>	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H <sup>+</sup> B AND 1060 B	7.5 (31.6°C)	5.5-9.0	-	-
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	7.4	≤ 30	-	2.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED FROM 103 TO 105 °C (SM: PART 2540 D)	19.2	≤ 40	-	5.0
SULPHIDE <sup>b</sup>	mg/L	IODOMETRIC METHOD (SM: PART 4500 -S <sup>2-</sup> F)	< 0.50	≤ 1.0	-	0.50
TOTAL KJELDAHL NITROGEN <sup>b</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	10.2	≤ 35	1.5	5.0
OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	< 3	≤ 20	-	3
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	-	0.1	-
MICROBIOLOGY						
TOTAL COLIFORMS <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	7,900	-	1.8	-
<b>SAMPLE CONDITION</b>						
WATER'S COLOUR/TURBID			YELLOW/TURBID			
SEDIMENT			BROWN			

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT NOT IN SCOPE OF ACCREDITATION

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24<sup>th</sup> EDITION, 2023.

REGULATORY STANDARD : RANGE OR MAXIMUM PERMITTED VALUE FOR BUILDING EFFLUENT STANDARDS CLASS B, NOTIFICATION OF THE MINISTRY OF RESOURCES AND ENVIRONMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 141, PART 233 D, DATED AUGUST 27, 2024.

ND : NOT DETECTED.

(MRS PIYAPAT SUTTAMANUTWONG)  
LABORATORY SUPERVISOR



รายงานผลการติดตามตรวจสอบคุณภาพน้ำทิ้ง  
เดือนมิถุนายน พ.ศ. 2568



## ANALYSIS REPORT

**CUSTOMER NAME** : HIVE SUKHUMVIT 65  
**ADDRESS** : 9/125 SOI SUKHUMVIT 65 PHRA KHANONG NUEA WATTHANA BANGKOK 10110  
**CONTACT INFORMATION** : TEL : 06 5607 0044 e-mail : Hive\_65125@hotmail.com  
**SAMPLING SOURCE** : -  
**SAMPLE TYPE** : WASTEWATER  
**SAMPLING DATE** : JUNE 23, 2025  
**SAMPLING TIME** : 13:30 HOUR  
**SAMPLING METHOD** : GRAB, GRAB AND STERILE TECHNIQUE  
**SAMPLING BY** : MR NAPAT TEMEYABUTR  
**ANALYZED BY** : MISS ARIYA THARAROM

**RECEIVED DATE** : JUNE 23, 2025  
**ANALYTICAL DATE** : JUNE 23 - JULY 1, 2025  
**ISSUE DATE** : JULY 3, 2025  
**REPORT NO.** : 2025-U060808  
**WORK NO.** : 2024-011374  
**ANALYSIS NO.** : T25AN850-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			ส่วนแยกภาค-เก็บตะกอน T25AN850-0001		
pH <sup>a</sup>	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H* B AND 1060 B	7.0 (30.2°C)	-	-
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	104	-	2.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED FROM 103 TO 105 °C (SM: PART 2540 D)	239	-	5.0
SULPHIDE <sup>b</sup>	mg/L	IODOMETRIC METHOD (SM: PART 4500-S <sup>2</sup> -F)	2.9	-	0.50
TOTAL KJELDAHL NITROGEN <sup>b</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	82.6	1.5	5.0
OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	11	-	3
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	0.1	-
<b>MICROBIOLOGY</b>					
TOTAL COLIFORMS <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	>160,000	1.8	-
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID SEDIMENT			BROWN/TURBID BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT NOT IN SCOPE OF ACCREDITATION

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24<sup>th</sup> EDITION, 2023.

ND : NOT DETECTED.

(MRS PIYAPAT SUTTAMANUTWONG)  
LABORATORY SUPERVISOR



## ANALYSIS REPORT

**CUSTOMER NAME** : HIVE SUKHUMVIT 65  
**ADDRESS** : 9/125 SOI SUKHUMVIT 65 PHRA KHANONG NUEA WATTHANA BANGKOK 10110  
**CONTACT INFORMATION** : TEL : 06 5607 0044 e-mail : Hive\_65125@hotmail.com  
**SAMPLING SOURCE** : -  
**SAMPLE TYPE** : EFFLUENT  
**SAMPLING DATE** : JUNE 23, 2025  
**SAMPLING TIME** : 13:20 HOUR  
**SAMPLING METHOD** : GRAB, GRAB AND STERILE TECHNIQUE  
**SAMPLING BY** : MR NAPAT TEMEYABUTR  
**ANALYZED BY** : MISS ARIYA THARAROM

**RECEIVED DATE** : JUNE 23, 2025  
**ANALYTICAL DATE** : JUNE 23 - JULY 1, 2025  
**ISSUE DATE** : JULY 3, 2025  
**REPORT NO.** : 2025-U060811  
**WORK NO.** : 2024-011374  
**ANALYSIS NO.** : T25AN850-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			ส่งเก็บน้ำใน T25AN850-0002			
pH <sup>a</sup>	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H* B AND 1060 B	6.8 (32.1°C)	5.5-9.0	-	-
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	37.1	≤ 30	-	2.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED FROM 103 TO 105 °C (SM: PART 2540 D)	14.6	≤ 40	-	5.0
SULPHIDE <sup>b</sup>	mg/L	IODOMETRIC METHOD (SM: PART 4500 -S <sup>2</sup> -F)	< 0.50	≤ 1.0	-	0.50
TOTAL KJELDAHL NITROGEN <sup>b</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	9.3	≤ 35	1.5	5.0
OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	< 3	≤ 20	-	3
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	-	0.1	-
<b>MICROBIOLOGY</b>						
TOTAL COLIFORMS <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	7,900	-	1.8	-
<b>SAMPLE CONDITION</b>						
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/TURBID BROWN			

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT NOT IN SCOPE OF ACCREDITATION

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24<sup>th</sup> EDITION, 2023.

REGULATORY STANDARD : RANGE OR MAXIMUM PERMITTED VALUE FOR BUILDING EFFLUENT STANDARDS CLASS B, NOTIFICATION OF THE MINISTRY OF RESOURCES AND ENVIRONMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 141, PART 233 D, DATED AUGUST 27, 2024.

ND : NOT DETECTED.

(MRS PIYAPAT SUTTAMANUTWONG)  
LABORATORY SUPERVISOR

ภาคผนวก ง

มาตรฐานตามประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง  
กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากอาคารบางประเภทและบาง  
ขนาด ประกาศในราชกิจจานุเบกษา เล่ม 141 ตอนที่ 233 ง วันที่ 27

สิงหาคม พ.ศ. 2567



ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม  
เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากอาคารบางประเภทและบางขนาด  
พ.ศ. ๒๕๖๗

โดยที่เป็นการสมควรปรับปรุงการกำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากอาคาร ให้เหมาะสม  
ตามความก้าวหน้าในทางวิทยาศาสตร์ เทคโนโลยี และความเปลี่ยนแปลงทางเศรษฐกิจ สังคม ของประเทศ  
และให้สอดคล้องกับสภาพการณ์ปัจจุบัน

อาศัยอำนาจตามความในมาตรา ๕๕ แห่งพระราชบัญญัติส่งเสริมและรักษาคุณภาพ  
สิ่งแวดล้อมแห่งชาติ พ.ศ. ๒๕๓๕ รัฐมนตรีว่าการกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม  
โดยคำแนะนำของคณะกรรมการควบคุมมลพิษ และโดยความเห็นชอบของคณะกรรมการสิ่งแวดล้อม  
แห่งชาติ จึงออกประกาศไว้ ดังต่อไปนี้

ข้อ ๑ ให้ยกเลิกประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐาน  
ควบคุมการระบายน้ำทิ้งจากอาคารบางประเภทและบางขนาด ฉบับวันที่ ๗ พฤศจิกายน พ.ศ. ๒๕๔๘

ข้อ ๒ ในประกาศนี้

“อาคาร” หมายความว่า อาคารที่ก่อสร้างขึ้น ไม่ว่าจะมิได้ขณะเป็นอาคารหลังเดียวหรือ  
เป็นกลุ่มของอาคารซึ่งตั้งอยู่ภายในพื้นที่ซึ่งเป็นบริเวณเดียวกัน และไม่ว่าจะมีหรือระบายน้ำทิ้งเดียวหรือ  
มีหลายท่อที่เชื่อมติดต่อกันระหว่างอาคารหรือไม่ก็ตาม

“น้ำทิ้ง” หมายความว่า น้ำที่เกิดจากกิจกรรมของอาคารที่ระบายหรือระบายลงสู่แหล่งน้ำ  
สาธารณะหรือออกสู่สิ่งแวดล้อม

ข้อ ๓ ให้แบ่งอาคาร ออกเป็น ๓ ชนิด คือ

ชนิดที่ ๑ อาคารอยู่อาศัย หมายถึง อาคารที่มีวัตถุประสงค์ให้เป็นที่พักอาศัยของบุคคล  
ทั้งการอยู่อาศัยอย่างถาวรหรือชั่วคราว ได้แก่

(๑) อาคารชุด ตามกฎหมายว่าด้วยอาคารชุด

(๒) หอพัก ตามกฎหมายว่าด้วยหอพัก

(๓) หอพัก ห้องเช่า ห้องแบ่งเช่า หรือกิจการอื่นในทำนองเดียวกันตามกฎหมายว่าด้วย  
การสาธารณสุข

(๔) สถานรับเลี้ยงเด็ก ตามกฎหมายว่าด้วยคุ้มครองเด็ก

(๕) สถานดูแลผู้สูงอายุหรือผู้พิการหรือทุพพลภาพ ตามกฎหมายว่าด้วยสถานประกอบการเพื่อสุขภาพ

(๖) ที่พักอาศัยสำหรับลูกจ้างประเภทกิจการก่อสร้าง ตามกฎหมายว่าด้วยการคุ้มครองแรงงาน

ชนิดที่ ๒ อาคารพาณิชย์ หมายถึง อาคารที่ใช้ประโยชน์ในการพาณิชย์กรรม หรือบริการธุรกิจ  
อย่างเดียวหรือหลายอย่าง ได้แก่

(๑) โรงแรม ตามกฎหมายว่าด้วยโรงแรม

- (๒) ศูนย์การค้าหรือห้างสรรพสินค้า  
(๓) ตลาด ตามกฎหมายว่าด้วยการสาธารณสุข  
(๔) สถานบริการประเภทสถานอาบน้ำ นวดหรืออบตัว ตามกฎหมายว่าด้วยสถานบริการ  
(๕)ภัตตาคารหรือร้านอาหาร  
(๖) อาคารที่ทำการของทางราชการ รัฐวิสาหกิจ หรือองค์การระหว่างประเทศและของเอกชน  
(๗) อาคารโรงเรียนเอกชน ตามกฎหมายว่าด้วยโรงเรียนเอกชน โรงเรียนของทางราชการ  
อาคารสถาบันอุดมศึกษาของเอกชน ตามกฎหมายว่าด้วยสถานอุดมศึกษาของเอกชนและสถาบันอุดมศึกษา  
ของทางราชการ

ชนิดที่ ๓ อาคารสถานพยาบาล หมายถึง สถานพยาบาล ตามกฎหมายว่าด้วยสถานพยาบาล  
ประเภทที่รับผู้ป่วยไว้ค้างคืน

ข้อ ๔ ให้แบ่งขนาดของอาคาร ออกเป็น ๔ ประเภท ดังต่อไปนี้

ประเภทอาคาร	หน่วย	อาคาร ประเภท ก.	อาคาร ประเภท ข.	อาคาร ประเภท ค.	อาคาร ประเภท ง.
๑. อาคารอยู่อาศัย					
อาคารชุด	ห้องชุด	ตั้งแต่ ๕๐๐ ขึ้นไป	ตั้งแต่ ๑๐๐ แต่ไม่ถึง ๕๐๐	ไม่ถึง ๑๐๐	-
หอพัก	ห้อง	-	ตั้งแต่ ๕๐๐ แต่ไม่ถึง ๕๐๐	ตั้งแต่ ๕๐ แต่ไม่ถึง ๒๕๐	ไม่ถึง ๕๐
หอพัก ห้องเช่า ห้องแบ่งเช่า หรือกิจการอื่นในทำนอง เดียวกัน ตามกฎหมาย ว่าด้วยการสาธารณสุข	ห้อง	-	ตั้งแต่ ๕๐๐ แต่ไม่ถึง ๕๐๐	ตั้งแต่ ๕๐ แต่ไม่ถึง ๒๕๐	ไม่ถึง ๕๐
สถานรับเลี้ยงเด็ก	-	-	-	-	ทุกขนาด
สถานดูแลผู้สูงอายุหรือ ผู้พิการหรือทุพพลภาพ	-	-	-	-	ทุกขนาด
ที่พักลูกจ้างสำหรับลูกจ้าง ประเภทกิจการก่อสร้าง	-	-	-	-	ทุกขนาด
๒. อาคารพาณิชย์					
โรงแรม	ห้อง	ตั้งแต่ ๒๐๐ แต่ไม่ถึง ๒๐๐	ตั้งแต่ ๖๐ แต่ไม่ถึง ๒๐๐	ไม่ถึง ๖๐	-
สถานบริการประเภท สถานอาบน้ำ นวดหรืออบตัว	ตาราง เมตร	-	ตั้งแต่ ๕,๐๐๐ ขึ้นไป	ตั้งแต่ ๑,๐๐๐ แต่ไม่ถึง ๕,๐๐๐	ไม่ถึง ๑,๐๐๐
โรงเรียนเอกชน โรงเรียนของ ทางราชการ สถานศึกษา ของเอกชนหรือสถาบัน อุดมศึกษาของทางราชการ	-	ตั้งแต่ ๒๕,๐๐๐ ขึ้นไป	ตั้งแต่ ๕,๐๐๐ แต่ไม่ถึง ๒๕,๐๐๐	-	ไม่ถึง ๕,๐๐๐

ประเภทอาคาร	หน่วย	อาคาร ประเภท ก.	อาคาร ประเภท ข.	อาคาร ประเภท ค.	อาคาร ประเภท ง.
อาคารที่ทำการของทาง ราชการ รัฐวิสาหกิจ หรือ องค์การระหว่างประเทศและ ของเอกชน		ตั้งแต่ ๕๕,๐๐๐ ขึ้นไป	ตั้งแต่ ๑๐,๐๐๐ แต่ไม่ถึง ๕๕,๐๐๐	ตั้งแต่ ๕,๐๐๐ แต่ไม่ถึง ๑๐,๐๐๐	ไม่ถึง ๕,๐๐๐
ศูนย์การค้า หรือห้างสรรพสินค้า		ตั้งแต่ ๒๕,๐๐๐ ขึ้นไป	ตั้งแต่ ๕,๐๐๐ แต่ไม่ถึง ๒๕,๐๐๐	-	ไม่ถึง ๕,๐๐๐
ตลาด		ตั้งแต่ ๒,๕๐๐ ขึ้นไป	ตั้งแต่ ๑,๕๐๐ แต่ไม่ถึง ๒,๕๐๐	ตั้งแต่ ๑,๐๐๐ แต่ไม่ถึง ๑,๕๐๐	ไม่ถึง ๑,๐๐๐
ภัตตาคารหรือร้านอาหาร		ตั้งแต่ ๒,๕๐๐ ขึ้นไป	ตั้งแต่ ๕๐๐ แต่ไม่ถึง ๒,๕๐๐	ตั้งแต่ ๕๐๐ แต่ไม่ถึง ๕๐๐	ไม่ถึง ๕๐๐
๓. อาคารสถานพยาบาล	เตียง	ตั้งแต่ ๓๐ ขึ้นไป	ตั้งแต่ ๑๐ แต่ไม่ถึง ๓๐	-	ไม่ถึง ๑๐

ข้อ ๕ กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากอาคารไว้ ดังต่อไปนี้

พารามิเตอร์	ค่ามาตรฐาน			
	อาคาร ประเภท ก.	อาคาร ประเภท ข.	อาคาร ประเภท ค.	อาคาร ประเภท ง.
๑. ความเบี่ยงเบนค่า (pH)	๕.๕ - ๙.๐	๕.๕ - ๙.๐	๕.๕ - ๙.๐	๕.๕ - ๙.๐
๒. ออกซิเจน (Biochemical Oxygen Demand)	ไม่เกิน ๒๐ มิลลิกรัมต่อลิตร	ไม่เกิน ๑๐ มิลลิกรัมต่อลิตร	ไม่เกิน ๕๐ มิลลิกรัมต่อลิตร	ไม่เกิน ๕๐ มิลลิกรัมต่อลิตร สำหรับอาคารอยู่อาศัย ไม่เกิน ๑๐๐ มิลลิกรัมต่อลิตร สำหรับอาคารพาณิชย์ และอาคารสถานพยาบาล
๓. ของแข็งแขวนลอยทั้งหมด (Total Suspended Solids)	ไม่เกิน ๓๐ มิลลิกรัมต่อลิตร	ไม่เกิน ๕๐ มิลลิกรัมต่อลิตร	ไม่เกิน ๕๐ มิลลิกรัมต่อลิตร	ไม่เกิน ๖๐ มิลลิกรัมต่อลิตร
๔. ของแข็งละลายทั้งหมด (Total Dissolved Solids)	ไม่เกิน ๑,๐๐๐ มิลลิกรัมต่อลิตร	ไม่เกิน ๑,๐๐๐ มิลลิกรัมต่อลิตร	ไม่เกิน ๑,๐๐๐ มิลลิกรัมต่อลิตร	-

พารามิเตอร์	ค่ามาตรฐาน			
	อาคาร ประเภท ก.	อาคาร ประเภท ข.	อาคาร ประเภท ค.	อาคาร ประเภท ง.
สำหรับอาคารอยู่ อาศัยและอาคาร พาณิชย์	สำหรับอาคารอยู่ อาศัยและอาคาร พาณิชย์	สำหรับอาคารอยู่ อาศัยและอาคาร พาณิชย์	สำหรับอาคารอยู่ อาศัยและอาคาร พาณิชย์	
เพื่อบำบัดจาก ปริมาณน้ำทิ้ง ปกติไม่เกิน ๑,๐๐๐ สำหรับอาคาร สถานพยาบาล	เพื่อบำบัดจาก ปริมาณน้ำทิ้ง ปกติไม่เกิน ๑,๐๐๐	เพื่อบำบัดจาก ปริมาณน้ำทิ้ง ปกติไม่เกิน ๑,๐๐๐	-	-
๕. ซัลไฟด์ (Sulfide)	ไม่เกิน ๑.๐ มิลลิกรัมต่อลิตร	ไม่เกิน ๑.๐ มิลลิกรัมต่อลิตร	ไม่เกิน ๑.๐ มิลลิกรัมต่อลิตร	-
๖. ไนโตรเจน (Total Kjeldahl Nitrogen)	ไม่เกิน ๓๕ มิลลิกรัมต่อลิตร	ไม่เกิน ๓๕ มิลลิกรัมต่อลิตร	ไม่เกิน ๔๐ มิลลิกรัมต่อลิตร	-
๗. น้ำมันและไขมัน (Oil and Grease)	ไม่เกิน ๒๐ มิลลิกรัมต่อลิตร	ไม่เกิน ๒๐ มิลลิกรัมต่อลิตร	ไม่เกิน ๒๐ มิลลิกรัมต่อลิตร	ไม่เกิน ๒๐ มิลลิกรัมต่อลิตร สำหรับอาคารอยู่อาศัย ไม่เกิน ๕๐ มิลลิกรัม ต่อลิตร สำหรับอาคาร พาณิชย์และอาคาร สถานพยาบาล
๘. แบคทีเรียกลุ่มโคลิฟอร์มทั้งหมด (Total Coliform Bacteria) (สำหรับอาคารสถานพยาบาล)	ไม่เกิน ๕,๐๐๐ (ไม่เกิน ๑,๐๐๐ มิลลิกรัม)	ไม่เกิน ๕,๐๐๐ (ไม่เกิน ๑,๐๐๐ มิลลิกรัม)	-	-
๙. แบคทีเรียกลุ่มโคลิฟอร์มที่ทน (Fecal Coliform Bacteria) (สำหรับอาคารสถานพยาบาล)	ไม่เกิน ๑,๐๐๐ (ไม่เกิน ๑๐๐ มิลลิกรัม)	ไม่เกิน ๑,๐๐๐ (ไม่เกิน ๑๐๐ มิลลิกรัม)	-	-
๑๐. คลอรีนอิสระ (Free Chlorine) (สำหรับอาคารสถานพยาบาล)	ไม่เกิน ๑.๐ มิลลิกรัมต่อลิตร	ไม่เกิน ๑.๐ มิลลิกรัมต่อลิตร	-	-

ข้อ ๖ การตรวจสอบมาตรฐานควบคุมการระบายน้ำทิ้งจากอาคารให้ใช้วิธีการ ดังต่อไปนี้

๖.๑ ความเป็นกรดและด่าง ให้ใช้เครื่องวัดความเป็นกรดและด่างของน้ำ (pH Meter)

ที่มีความละเอียดไม่ต่ำกว่า ๐.๑ หน่วย

๖.๒ บีโอดี ให้ใช้วิธีเบ็ดเตล็ดอย่างใดอย่างหนึ่ง ๒๐ องศาเซลเซียส เป็นเวลา ๕ วันติดต่อกัน และหาค่าออกซิเจนละลายด้วยวิธีเอไซด์มอดิฟิเคชัน (Aside Modification) หรือวิธีเมมเบรนอิเล็กโทรด (Membrane Electrode) หรือวิธีออปติคัลโพรบ (Optical Probe)

๖.๓ ขอบเข้มน้ำแขวนลอยทั้งหมด ให้ใช้วิธีการกรองผ่านกระดาษกรองใยแก้ว (Glass Fiber Filter) และอบแห้งที่อุณหภูมิ ตั้งแต่ ๑๐๓ ถึง ๑๐๕ องศาเซลเซียส เป็นเวลาอย่างน้อย ๑ ชั่วโมง

๖.๔ ขอบเข้มน้ำทั้งหมด ให้ใช้วิธีระเหยด้วยอ่างที่กรองผ่านกระดาษกรองใยแก้ว (Glass Fiber Filter) และอบแห้งที่อุณหภูมิ ๑๘๐ องศาเซลเซียส เป็นเวลาอย่างน้อย ๑ ชั่วโมง

๖.๕ ซัลไฟด์ ให้ใช้วิธีไอโอดิเมตริก (Iodometric Method) หรือวิธีเมทิลีนบลู (Methylene Blue Method)

๖.๖ ทีเคแอล ให้ใช้วิธีเจลดาล์ (Kjeldahl)

๖.๗ น้ำนํ้าและไขมัน ให้ใช้วิธีสกัดด้วยตัวทำละลายแล้วแยกน้ำนํ้าของน้ำมันและไขมัน

๖.๘ แบคทีเรียกลุ่มโคลิฟอร์มทั้งหมดและแบคทีเรียกลุ่มโคลิฟอร์ม ให้ใช้วิธีมัลติเทิล ทิวบ์ เฟอว์แมนเทชัน เทคนิค (Multiple Tube Fermentation Technique)

๖.๙ คลอรีนอิสระ ให้ใช้วิธีไทเทรต (Titrimetric method) หรือวิธีเทียบสี (Colorimetric method) หรือวิธีอิเล็กโทรดิก อิเล็กโทรด (Iodometric Electrode Technique)

ข้อ ๗ การคิดคำนวณขนาดของอาคารตามข้อ ๕ ให้เป็นไปตามวิธีการที่คณะกรรมการควบคุมมลพิษกำหนด โดยประกาศในราชกิจจานุเบกษา

ข้อ ๘ การตรวจสอบค่ามาตรฐานน้ำทิ้งตามข้อ ๖ ต้องเป็นไปตามคู่มือวิเคราะห์น้ำและน้ำเสียของสมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย หรือ Standard Methods for the Examination of Water and Wastewater ซึ่ง American Public Health Association, American Water Works Association และ Water Environment Federation ของประเทศสหรัฐอเมริกากำหนดฉบับล่าสุด หรือตามที่คณะกรรมการควบคุมมลพิษประกาศในราชกิจจานุเบกษา

ข้อ ๙ การเก็บตัวอย่างน้ำทิ้งเพื่อการตรวจสอบมาตรฐานควบคุมการระบายน้ำทิ้งตามข้อ ๕ ให้เป็น ดังต่อไปนี้

๙.๑ ให้เก็บในจุดระบายทิ้งลงสู่แหล่งน้ำสาธารณะหรือออกสู่สิ่งแวดล้อมหรือจุดอื่นที่สามารถใช้เป็นตัวแทนของน้ำทิ้งที่ระบายออกจากอาคาร ในกรณีที่มีการระบายทิ้งหลายจุดให้เก็บทุกจุด

๙.๒ วิธีการเก็บตัวอย่างน้ำทิ้ง ณ จุดเก็บตัวอย่างตามข้อ ๙.๑ ให้เก็บแบบจับจ้วง (Grab Sampling)

ข้อ ๑๐ ประกาศนี้ให้ใช้บังคับตั้งแต่วันถัดจากวันประกาศในราชกิจจานุเบกษาเป็นต้นไป

ประกาศ ณ วันที่ ๒๘ มิถุนายน พ.ศ. ๒๕๖๗

พลตำรวจเอก พัชรวาท วงษ์สุวรรณ

รัฐมนตรีว่าการกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม

ภาคผนวก จ  
เอกสารเทียบเครื่องมือที่ใช้ในการตรวจวิเคราะห์



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-SFAC7 / 132931010	Technology Promotion Association (Thailand-Japan)	24MM022	11/02/24	10/02/25
2	Analytical Balance	TOTAL SUSPENDED SOLIDS	Mettler Toledo	XPR205004 / C200071872	National Food Institute, Ministry of Industry, Thailand	2502226-01-01	20/02/23	19/02/25
3	BOD Incubator	BIOCHEMICAL OXYGEN DEMAND	ANCO	UP-51207 / 102	Technology Promotion Association (Thailand-Japan)	24TM113	11/02/24	10/02/25
4	DO Meter	BIOCHEMICAL OXYGEN DEMAND	YSI	S102 / 118 101863	Technology Promotion Association (Thailand-Japan)	24TW29	10/02/23	10/02/25
5	Net Air Oven	TOTAL SUSPENDED SOLIDS	Mettler	UF56 / B214.1666	National Food Institute, Ministry of Industry, Thailand	2500118-201-01	01/02/24	01/02/25
6	Grated Incubator	TOTAL COLIFORM BACTERIA	Bioher	H0400 / 2022000000291	National Food Institute, Ministry of Industry, Thailand	2502226-008-01	10/02/25	10/02/26
7	Hygic System Chilling Unit	TOTAL KIELOMIL NITROGEN	Foss Teator (Labco)	RT200 / 01780524	FOS South East Asia	13010	27/02/23	26/02/25
8	Hygic Chilling Unit	TOTAL KIELOMIL NITROGEN	FOS	KG402 8100 / 0185002	FOS South East Asia	13864	24/02/23	23/02/25
9	pH Meter	pH	Hanna	LAQUA-PH210 / HA0A0007	Technology promotion association (Thailand-Japan)	2504N03	20/02/23	19/02/25

Due Date of Calibration : Based on the arrival calibration date. At least 1 time per year.

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-SFAC7 / 132931010	United Analytical and Engineering Consultant Co., Ltd.	250422 / 18.002.25	23/02/23	22/02/25
2	Analytical Balance	TOTAL SUSPENDED SOLIDS	Mettler Toledo	XPR205004 / C200071872	National Food Institute, Ministry of Industry, Thailand	2502226-001-01	20/02/23	19/02/25
3	DO Meter	BIOCHEMICAL OXYGEN DEMAND	YSI	S102 / 118 101863	Technology Promotion Association (Thailand-Japan)	24TW29	10/02/23	10/02/25
4	Incubator	TOTAL COLIFORM BACTERIA	Bioher	H0400 / 2022000000291	Technology Promotion Association (Thailand-Japan)	24TM084	7/02/24	6/02/25
5	pH Meter	pH	Hanna	LAQUA-PH210 / HA0A0007	Technology promotion association (Thailand-Japan)	2504N03	20/02/23	19/02/25

Due Date of Calibration : Based on the arrival calibration date. At least 1 time per year.

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-SFAC7 / 132931010	Technology Promotion Association (Thailand-Japan)	24MM022	11/02/24	10/02/25
2	Analytical Balance	TOTAL SUSPENDED SOLIDS	Mettler Toledo	XPR205004 / C200071872	National Food Institute, Ministry of Industry, Thailand	2402235-004-01	20/02/24	19/02/25
3	BOD Incubator	BIOCHEMICAL OXYGEN DEMAND	ANCO	UR-1321 / -	Technology Promotion Association (Thailand-Japan)	24TM087	14/02/24	13/02/25
4	DO Meter	BIOCHEMICAL OXYGEN DEMAND	YSI	S102 / 118 101863	Technology Promotion Association (Thailand-Japan)	24TW29	21/02/24	20/02/25
5	Incubator	TOTAL COLIFORM BACTERIA	Bioher	H0400 / 2022000000291	Technology Promotion Association (Thailand-Japan)	24TM084	7/02/24	6/02/25
6	Hygic Chilling Unit	TOTAL KIELOMIL NITROGEN	FOS	KT9 / 01906303	FOS South East Asia	13875	07/02/24	4/02/25
7	pH Meter	pH	YSI Environmental	pH 1004 / 220354	Technology Promotion Association (Thailand-Japan)	24CH1078	07/02/24	06/02/25

Due Date of Calibration : Based on the arrival calibration date. At least 1 time per year.

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-SFAC7 / 132931010	Technology Promotion Association (Thailand-Japan)	24MM022	11/02/24	10/02/25
2	Analytical Balance	TOTAL SUSPENDED SOLIDS	Mettler Toledo	XPR205004 / C200071872	National Food Institute, Ministry of Industry, Thailand	2402235-004-01	20/02/24	19/02/25
3	DO Meter	BIOCHEMICAL OXYGEN DEMAND	YSI	S102 / 118 101863	Technology Promotion Association (Thailand-Japan)	23TW29	10/02/23	10/02/25
4	Net Air Oven	TOTAL SUSPENDED SOLIDS	Mettler	UF56 / B212.0411	Technology Promotion Association (Thailand-Japan)	23TM278	09/02/23	10/02/25
5	Incubator	TOTAL COLIFORM BACTERIA	Bioher	H0400 / 2022000000291	Technology Promotion Association (Thailand-Japan)	24TM08	07/02/24	07/02/25
6	Hygic Chilling Unit	TOTAL KIELOMIL NITROGEN	FOS	KT9 / 01906303	FOS South East Asia	13875	07/02/24	4/02/25
7	pH Meter	pH	Hanna	LAQUA-PH210 / HA0E0009	Technology promotion association (Thailand-Japan)	2502N01	10/02/25	10/02/26

Due Date of Calibration : Based on the arrival calibration date. At least 1 time per year.

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-SFAC1 / 123261910	United Analyst and Engineering Consultant Co., Ltd.	250422 / 18.002.25	25/04/2025	25/04/2026
2	Analytical Balance	TOTAL SUSPENDED SOLIDS	Mettler Toledo	XS105SDU / CD007872	National Food Institute, Ministry of Industry, Thailand	202225-01-01	20/09/2025	19/09/2026
3	D.O Meter	BIOCHEMICAL OXYGEN DEMAND	YSI	5102 / 118.101803	Technology Promotion Association (Thailand-Japan)	201909	19/07/2025	19/07/2026
4	Incubator	TOTAL COLIFORM BACTERIA	BINDER	82400 / 2023200000001	Technology Promotion Association (Thailand-Japan)	201909	19/07/2025	19/07/2026
5	Hydro Calibration Unit	TOTAL KIELOXAMINE NITROGEN	FOSS	KTY / F180293	FOSS South East Asia	13013	07/02/2024	07/02/2025
6	pH Meter	pH	HANNA	LACUA-PH201 / 1A110035	technology promotion association (thailand-japan)	250422	25/02/2025	27/02/2026

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

United Analyst and Engineering Consultant Co., Ltd. (UAE)  
Certified Laboratory ISO/IEC 17025

Certificate Page 1 of 1

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-SFAC1 / 123261910	United Analyst and Engineering Consultant Co., Ltd.	250422 / 18.002.25	25/04/2025	25/04/2026
2	Analytical Balance	TOTAL SUSPENDED SOLIDS	Mettler Toledo	XS105SDU / CD007872	National Food Institute, Ministry of Industry, Thailand	202225-01-01	20/09/2025	19/09/2026
3	D.O Meter	BIOCHEMICAL OXYGEN DEMAND	YSI	5102 / 118.101803	Technology Promotion Association (Thailand-Japan)	201909	19/07/2025	19/07/2026
4	Incubator	TOTAL COLIFORM BACTERIA	BINDER	82400 / 2023200000001	National Food Institute, Ministry of Industry, Thailand	202225-01-01	19/07/2025	19/07/2026
5	Hydro Calibration Unit	TOTAL KIELOXAMINE NITROGEN	FOSS	KTY / F180293	FOSS South East Asia	13118	27/09/2025	26/09/2026
6	Hydro Calibration Unit	TOTAL KIELOXAMINE NITROGEN	FOSS	KTY / F180293	FOSS South East Asia	13014	24/02/2025	23/02/2026
7	pH Meter	pH	HANNA	LACUA-PH201 / 1A110035	technology promotion association (thailand-japan)	250422	25/02/2025	27/02/2026

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

United Analyst and Engineering Consultant Co., Ltd. (UAE)  
Certified Laboratory ISO/IEC 17025

Certificate Page 1 of 1



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



Certificate of Calibration

Cert.No.: 24CH1379  
Page: 1 of 3

Equipment: pH Meter  
Manufacturer: EcoSense  
Model: pH100A  
Serial No.: JC03354  
ID No.: UAE.EFM.083/2582(ENV.pH03/62)  
Condition As-Received: Used item  
Received Date: 05 November 2024  
Calibration Date: 08 November 2024  
Reference: 2411-0122WSC-1  
Submitted by: United Analyst and Engineering Consultant Co.,Ltd  
3 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Phra Khanong, 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-CH5 by comparison with temperature standard

Calibrated by: Warakorn Lemagatirakul

Approved by: \_\_\_\_\_  
Approved Signatory

( ) Unnopphol Harschai  
(✓) Ponpan Paipim  
( ) Sathip Meangmai

Issue Date: 08 November 2024

The Uncertainties are for a confidence probability of approximately 95%

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Cert.No.: 24CH1379  
Page: 2 of 3

Condition of this calibration result

- Reference Standard Instrument
- Instrument
- Document Process Calibrator
- Ref. Standard Thermometer

Serial No. ID No. Cert. No. Due Date  
54030049 130RC116 24E2759 25 Aug 2025  
4982054 110RC044 241757 14 July 2025

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

- Certified Reference Materials :The measurement results are traceable to SI through Hach Lange GmbH Ltd.,  
Deutsche Akkreditierungsstelle, Accredited No.D-RM-15164-01-00

Buffer Solution Manufacturer Lot No. Exp. date  
pH 4.008 CPA chem 1034203 27 Sep 2026  
pH 6.999 Hach Lange GmbH CD3145 28 Feb 2026  
pH 10.010 CPA chem 1034205 27 Sep 2025

- 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
			pH	mV		
pH Meter S/N.: JC03354	4.00	177.48	177	4.01	0.58	2.00
	7.00	0.00	0	7.00	0.58	2.00
	7.00	0.00	0	7.00	0.58	2.00
	10.00	-177.48	-178	10.01	0.58	2.00



Cert.No.: 24CH1379  
Page: 3 of 3

#### Calibration Results

Function : pH Measurement

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

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: 240710SIA605377	4.008	4.01	173	0.0079	2.00
	6.999	7.00	-2	0.0092	2.00
	6.999	7.00	-2	0.0095	2.00
	10.010	10.01	-178	0.0092	2.00

Function : Temperature Measurement

(\*) Without adjustment

This equipment was connected with Temperature Probe;

- Model :

- Serial No. : 240710SIA605377

Dimension of probe

- Length : 110 mm.

- Diameter : 12 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	15.003	14.9	-0.103	0.13	2.00
30.0	30.001	29.9	-0.101	0.13	2.00
45.0	45.003	44.8	-0.203	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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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES  
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250  
TEL.0-2717-3000-29 FAX.0-2719-9494



## Certificate of Calibration

Cert.No.: 24MM282  
Page: 1 of 3

Equipment : Electronic Balance

Manufacturer : Mettler Toledo

Model : AB204-S/FACT

Serial No. : 1129381010

ID No. : UAE.WAS.002/2552

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

Location : Balance Room (108)

Received order : 11 May 2024

Calibration Date : 11 May 2024

Ambient Temperature : 15 °C to 40 °C

Relative Humidity : 30 % to 90 %

Calibrated by : Khit Rutanaprapachai

Approved by :

Kunchit

Approved Signatory

( ) Ponpan Palpim

( ) Suwit Imjai

(✓) Kunchit Prompral

Issue Date : 15 May 2024

The Uncertainties are for a confidence probability of approximately 95 %

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Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services

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Equipment : Electronic Balance  
Condition As-Received : Used Item  
Reference : 2405-0166OC-1

Cert.No.: 24MM282  
Page: 2 of 3

Procedure used :-

Calibration were conducted using in-house calibration procedure CP-0801 based on UKAS LAB 14 according to direct measurement method against standard weight.

Condition of this result of calibration

1. Reference standard instruments:-

Instruments	Model	Serial No.	ID No.	Test report No.	Due date
1) Standard Weight Set (E2)	15884	24053	70RC007	MM-0013-24	25 Jan 2026

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

3. This result of calibration was made on requested at the point specified by customer.

4. This certificate is not certified for any commercial transaction.

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

Result of calibration ( ) Without Adjustment ( \* ) After Adjustment by Internal Calibration

Range capacity : 0 g to 220 g Resolution 0.0001 g

Before Adjustment :

Applied Weight (g)	Balance Reading (g)	Correction (g)	Measurement Uncertainty (± mg)	Coverage Factor (k)
100	100.0000	0.0000	0.19	2.03
200	200.0006	-0.0006	0.30	2

After Adjustment :

1. Determination of the standard deviation of weighing machine (n = 10)

Applied Weight (g)	Standard Deviation of Reading (g)
100	0.00007
200	0.00005



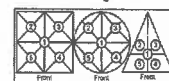
Equipment : Electronic Balance  
Condition As-Received : Used Item  
Reference : 2405-0166OC-1

Cert.No.: 24MM282  
Page: 3 of 3

Result of calibration

2. Effect of off-center loading

A mass of 100 g was placed to various position on the pan.  
The weighing machine reading error obtained is given in the table



Position 1 (g)	Position 2 (g)	Position 3 (g)	Position 4 (g)	Position 5 (g)	Maximum difference between off-center and central loading (g)
-0.0004	-0.0004	-0.0003	-0.0003	-0.0004	0.0001

3. Departure from nominal value

Applied Weight (g)	Balance Reading (g)	Correction (g)	Measurement Uncertainty (± mg)	Coverage Factor (k)
Unload	0.0000	0.0000	0.15	2.13
0.01	0.0100	0.0000	0.15	2.13
0.05	0.0500	0.0000	0.15	2.13
0.1	0.1000	0.0000	0.15	2.13
0.5	0.5000	0.0000	0.15	2.13
1	1.0000	0.0000	0.15	2.13
10	10.0000	0.0000	0.15	2.11
50	49.9999	+0.0001	0.17	2.06
100	99.9998	+0.0001	0.19	2.03
150	149.9998	+0.0002	0.28	2
200	199.9990	+0.0010	0.30	2

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



Cert. No.: 24TM567  
Page: 1 of 3

## Certificate of Calibration

Equipment : BOD Incubator  
Manufacturer : ARCO  
Model : UR-1320  
Serial No. :  
ID No. : UAE.WAO.018/2551  
Submitted by : United Analyst and Engineering Consultant Co., Ltd.  
3 Sol Udomsuk 41, Sukhumvit Road,  
Bangchak, Phraekhanong,  
Bangkok 10260  
Location : Lab Floor 2  
Received Order : 01 April 2024  
Calibration Date : 01 April 2024  
Ambient Temperature :  $(26 \pm 10) ^\circ\text{C}$   
Relative Humidity :  $(50 \pm 30) \%$   
Calibrated by : Kriade Maloe  
Approved by :  
( ) Ponpan Palpin  
(✓) Suwit Imjai  
( ) Kunthit Promprat  
Issue Date : 5 April 2024

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

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Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.

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A 0065063



Equipment : BOD Incubator  
Condition As-Received : Used Item  
Reference : 2404-0004OC-1  
Procedure Used :-

Cert. No.: 24TM587  
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	23LM115	TPA	11 Jul 2024

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.

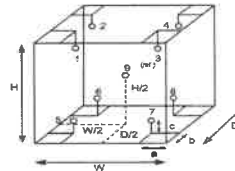
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- ( ) Without Adjustment

Function of UUC\* : Temperature Source

Fresh air setting : Not Available

Environment during calibration		
	Beginning	Finished
Temp. (°C)	27	26
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 = 0.82 m  
W = 1.2 m  
H = 1.2 m  
Capacity = 0.89 m<sup>3</sup>

Position :	Ref. Std. ID No.:
1	18-18RTD-01
2	18-18RTD-02
3	18-18RTD-03
4	18-18RTD-04
5	18-18RTD-05
6	23-18RTD-06
7	18-18RTD-07
8	22-18RTD-08
9 (ref.)	18-18RTD-09

เอกสารไม่ควบคุม  
a 1209743



Equipment : BOD Incubator  
Condition As-Received : Used Item  
Reference : 2404-0004OC-1  
Result of Calibration :- ( ) Without Adjustment  
Function of UUC\* : Temperature Source  
Fresh air setting : Not Available

Cert. No.: 24TM587  
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	20.0	0.45	0.55	1.3	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (± °C)
	1	2	3	4	5	6	7	8	9 (ref.)	
20.0	19.954	20.183	20.235	19.707	19.706	19.739	19.785	19.821	19.828	0.55

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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a 1209742



## Certificate of Calibration

Cert. No.: 24TM884  
Page: 1 of 3

Equipment : Incubator  
Manufacturer : Binder  
Model : KB 400  
Serial No. : 2022000000391  
ID No. : UAE.MIC.028/2555  
Submitted by : United Analyst and Engineering Consultant Co., Ltd.  
3 Sol Udomsuk 41, Sukhumvit Road,  
Bangchak, Phraekhanong,  
Bangkok 10260  
Location : Microbiology Laboratory  
Received Order : 07 June 2024  
Calibration Date : 07 June 2024  
Ambient Temperature :  $(26 \pm 10) ^\circ\text{C}$   
Relative Humidity :  $(50 \pm 30) \%$   
Calibrated by : Tewatchai Pama  
Approved by :  
( ) Ponpan Palpin  
( ) Suwit Imjai  
(✓) Kunthit Promprat  
Issue Date : 11 June 2024

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

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Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.

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Equipment : Incubator  
Condition As-Received : Used Item  
Reference : 2408-0190C-2  
Procedure Used :-

Cert. No.: 24TM884  
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	MY49001451	24LM44	TPA	17 Mar 2025

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

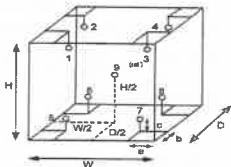
3. This certification is traceable to the International System of Unit.

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

Result of Calibration :- ( \* ) Without Adjustment

Function of UUC\* : Temperature Source

Fresh air setting : Close



#### Probe Installation Details :

a = 10 cm  
b = 10 cm  
c = 10 cm

#### Dimension of Chamber :

D = 0.50 m  
W = 0.65 m  
H = 1.2 m  
Capacity = 0.39 m<sup>3</sup>

Environment during calibration		
	Beginning	Finished
Temp. ( °C )	21	19
REL Humid ( % )	77	75
AC Supply ( Volt )	228	229

Position :	Ref. Std. ID No.:
1	19RTD-2/1
2	19RTD-2/2
3	19RTD-2/3
4	19RTD-2/4
5	19RTD-2/5
6	24-19RTD-2/6
7	19RTD-2/7
8	19RTD-2/8
9 (ref.)	19RTD-2/9

เอกสารไม่ควบคุม



Equipment : Incubator  
Condition As-Received : Used Item  
Reference : 2408-0190C-2  
Result of Calibration :- ( \* ) Without Adjustment  
Function of UUC\* : Temperature Source  
Fresh air setting : Close

Cert. No.: 24TM884  
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
35.0	35.0	35.0	0.028	0.28	0.53	2

Calibration Point ( °C )	Measured Temperature ( °C )									Uncertainty ( ± °C )
	1	2	3	4	5	6	7	8	9 (ref.)	
35.0	35.317	35.164	35.142	35.064	35.098	35.093	34.894	34.826	35.056	0.30

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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UAE.FM.6.4.016-1(0)/09-SEP-2020

### กำหนดจุดห้ามใช้งาน

References Certificate Number. : 24TM884

Equipment : Incubator

Model : KB 400

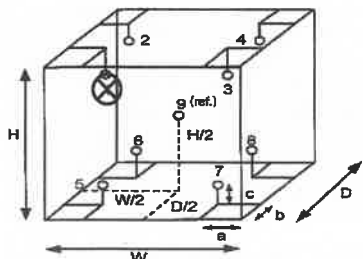
Serial No. : 20220000000391

ID No. : UAE.MIC.029/2565

Manufacturer : Binder

Calibration Point : 35.0 °C

Unit Under Calibration Setting : 35.0 °C



รูปภาพเครื่องมือ แสดงจุดที่ได้รับการสอบเทียบ และสัญลักษณ์ ⊗ แสดงจุดห้ามใช้งาน

กำหนดจุดห้ามใช้งานตำแหน่งที่.....1.....

หมายเลข ใบรับแก้ไข...../.....

Uae.netapp\app\_LAB\Lab-INSTRUMENT 11-206.4\Certificate\ใบกำหนดจุดห้ามใช้งาน\ใบรับแก้ไข 2367\กำหนดจุดห้ามใช้งาน

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.: 24TW39  
Page: 1 of 2

### Certificate of Testing

Equipment : DO Meter  
Manufacturer : Y8I  
Model : 5100  
Serial No. : 11B 101863  
ID No. : UAE.WAD.004/2554  
Received Date : 20 February 2024  
Test Date : 21 February 2024  
Reference : 2402-0628DSC-1  
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.  
3 Soi Udomsuk 41, Sukhumvit Road, Bangkok,  
Phrahanong, Bangkok 10260  
Laboratory Condition : Temperature ( 25 ± 5 ) °C  
Humidity ( 50 ± 20 ) %  
Test Procedure : In - house method : CP-CH8  
by Comparison Technique with Azide Modification Method  
Tested by : Walalek Sirithuan  
Approved by :   
Approved Signatory  
( ) Pornthipa Tameyakul  
( ) Unnopphol Harachai  
(✓) Sathip Meangmai

Issue Date : 22 February 2024

เอกสารไม่ควบคุม





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



## Calibration Report

Certificate No.: 2402283-001-01

Equipment:

Electronic Balance

Model: XSR20SDU

Serial No.: C009071872

Capacity: 220 g

Manufacturer: METTLER TOLEDO

Resolution: 0.0001 g / 0.0001 g

ID No.: UAE.WAO.012/2563

Date of Calibration: 2 April 2024

Page 3 of 4

Calibration Results: (Continued)

Calibration Range: 0 - 80 g

Calibration Adjustment: Internal Calibration

3. Departure from Nominal Value: (Range: 0 - 80 g; Resolution: 0.00001 g)

Nominal Value	Standard Value	Average Reading	Correction	Uncertainty	Coverage Factor
(g)	(g)	(g)	(g)	(g)	k
Unloaded	0.000000	0.000000	0.000000	0.0000003	2.00
0.001	0.001003	0.001003	-0.000003	0.0000091	2.00
0.005	0.005003	0.005003	0.000001	0.0000094	2.00
0.01	0.010003	0.010003	0.000000	0.0000091	2.00
0.05	0.049996	0.049996	0.000000	0.0000098	2.00
0.1	0.100011	0.100000	0.000011	0.0000111	2.00
0.5	0.500016	0.500001	0.000015	0.000014	2.00
1	1.000023	1.000001	-0.000022	0.000018	2.00
2	2.000023	2.000001	-0.000022	0.000017	2.00
5	5.000017	5.000001	-0.000016	0.000020	2.00
10	10.000009	10.000000	-0.000009	0.000026	2.00
20	20.000021	20.000001	-0.000020	0.000027	2.00
30	30.000040	30.000001	-0.000039	0.000032	2.00
50	50.000028	50.000004	-0.000024	0.000058	2.00
80	80.000068	80.000001	-0.000067	0.00011	2.00

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

2500 ถนนพหลโยธิน แขวงสามยุค กรุงเทพมหานคร 10700 ประเทศไทย  
2500 Soi 36, Aun Auen Road, Bang Tri Khun Suburban, Bang Phli District, Bangkok 10700, Thailand  
Tel: +662 2428 8888 Fax: +662 2428 8543

Handwritten signature



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



## Calibration Report

Certificate No.: 2402283-001-01

Equipment:

Electronic Balance

Model: XSR20SDU

Serial No.: C009071872

Capacity: 220 g

Manufacturer: METTLER TOLEDO

Resolution: 0.0001 g / 0.0001 g

ID No.: UAE.WAO.012/2563

Date of Calibration: 2 April 2024

Page 4 of 4

Calibration Results: (Continued)

Calibration Range: 81 - 200 g

Calibration Adjustment: Internal Calibration

3. Departure from Nominal Value: (Range: 81 - 200 g; Resolution: 0.0001 g)

Nominal Value	Standard Value	Average Reading	Correction	Uncertainty	Coverage Factor
(g)	(g)	(g)	(g)	(g)	k
80	90.00010	90.0000	0.0001	0.00015	2.00
100	100.00006	100.0000	0.0001	0.00015	2.00
110	110.00007	110.0000	0.0001	0.00017	2.00
120	120.00009	120.0000	0.0001	0.00018	2.00
130	130.00010	130.0000	0.0001	0.00019	2.00
140	140.00014	140.0000	0.0001	0.00020	2.00
150	150.00009	150.0000	0.0001	0.00020	2.00
160	160.00010	160.0000	0.0001	0.00022	2.00
170	170.00012	170.0000	0.0001	0.00023	2.00
200	200.00016	200.0000	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 %.

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

2500 ถนนพหลโยธิน แขวงสามยุค กรุงเทพมหานคร 10700 ประเทศไทย  
2500 Soi 36, Aun Auen Road, Bang Tri Khun Suburban, Bang Phli District, Bangkok 10700, Thailand  
Tel: +662 2428 8888 Fax: +662 2428 8543

Handwritten signature



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES  
634/4 PATTANAKORN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250  
TEL.0-2717-3000-29 FAX.0-2710-9494



## Certificate of Calibration

Cert.No.: 24MM282  
Page: 1 of 3

Equipment: Electronic Balance

Manufacturer: Mettler Toledo

Model: AB204-S/FACT

Serial No.: 1129361010

ID No.: UAE.WAS.002/2552

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

Location: Balance Room (106)

Received order: 11 May 2024

Calibration Date: 11 May 2024

Ambient Temperature: 15 °C to 40 °C

Relative Humidity: 30 % to 80 %

Calibrated by: Khit Rutanaprasachal

Approved by: Kunchit  
Approved Signatory

( ) Porpan Palpin  
( ) Suwit Imjai  
(✓) Kunchit Promprat

Issue Date: 15 May 2024

The Uncertainties are for a confidence probability of approximately 95%

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Approval of the head of Corporate Services & Equipment Calibration and Testing Services.

เอกสารไม่ควบคุม



Equipment: Electronic Balance  
Condition As-Received: Used Item  
Reference: 2405-01560C-1  
Procedure used:-

Cert.No.: 24MM282  
Page: 2 of 3

Calibration were conducted using In-house calibration procedure CP-0801 based on UKAS LAB 14 according to direct measurement method against standard weight.

Condition of this result of calibration

1. Reference standard instruments:-

Instruments	Model	Serial No.	ID No.	Test report No.	Due date
1) Standard Weight Set (E2)	15884	24053	70RC007	MM-0013-24	25 Jan 2026

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

3. This result of calibration was made on requested at the point specified by customer.

4. This certificate is not certified for any commercial transaction.

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

Result of calibration ( ) Without Adjustment ( \* ) After Adjustment by Internal Calibration

Range capacity: 0 g to 220 g Resolution 0.0001 g

Before Adjustment:

Applied Weight	Balance Reading	Correction	Measurement Uncertainty	Coverage Factor
(g)	(g)	(g)	(± mg)	(k)
100	100.0000	0.0000	0.19	2.03
200	200.0006	-0.0006	0.30	2

After Adjustment:

1. Determination of the standard deviation of weighing machine ( n = 10 )

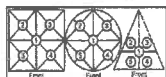
Applied Weight	Standard Deviation of Reading (g)
(g)	
100	0.00007
200	0.00005

เอกสารไม่ควบคุม



Equipment : Electronic Balance  
Condition As-Received : Used Item  
Reference : 2405-0168OC-1

Cert.No.: 24MM292  
Page: 3 of 3



Maximum difference between off-center and central loading (g)

Position 1 (g)	Position 2 (g)	Position 3 (g)	Position 4 (g)	Position 5 (g)
-0.0004	-0.0004	-0.0003	-0.0003	-0.0004

0.0001

### 3. Departure from nominal value

Applied Weight (g)	Balance Reading (g)	Correction (g)	Measurement Uncertainty (± mg)	Coverage Factor (k)
Unload	0.0000	0.0000	0.15	2.13
0.01	0.0100	0.0000	0.15	2.13
0.05	0.0500	0.0000	0.15	2.13
0.1	0.1000	0.0000	0.15	2.13
0.5	0.5000	0.0000	0.15	2.13
1	1.0000	0.0000	0.15	2.13
10	10.0000	0.0000	0.15	2.11
50	49.9999	+0.0001	0.17	2.06
100	99.9999	+0.0001	0.19	2.03
150	149.9998	+0.0002	0.29	2
200	199.9990	+0.0010	0.30	2

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 %.

-00-

เอกสารไม่ควบคุม



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES  
534/4 PATTANAKARN ROAD SOI 18, SUANLIANG, SUANLIANG BANGKOK 10250  
TEL:0-2717-3000-29 FAX:0-2719-8484

TPA-C-MRA



## Certificate of Calibration

Cert. No.: 24TM638  
Page: 1 of 3

Equipment : Incubator

Manufacturer : Binder

Model : KB 400 E6

Serial No. : 20220000022479

ID No. : UAE.MIC.028/2566

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

Location : Microbiology Laboratory

Received Order : 09 July 2024

Calibration Date : 09 July 2024

Ambient Temperature : ( 26 ± 10 ) °C

Relative Humidity : ( 50 ± 30 ) %

Calibrated by : Khit Rutanasaprechai

Approved by :

Approved Signatory

( ) Ponpan Paipim  
(✓) Sumit Injai  
( ) Kunchit Promprat

Issue Date : 19 July 2024

The Uncertainties are for a confidence probability of approximately 95%

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เอกสารไม่ควบคุม



Equipment : Incubator  
Condition As-Received : Used Item  
Reference : 2407-0153OC-4

Cert. No.: 24TM638  
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	MY49001451	24LM44	TPA	17 Mar 2025

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

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

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

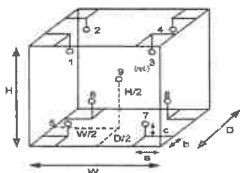
Result of Calibration :- ( " ) Without Adjustment

Function of UUC\* : Temperature Source

Fresh air setting : Not Available

Environment during calibration		
	Beginning	Finished
Temp. ( °C )	23	24
REL.Humid. ( % )	52	54
AC Supply ( Volt )	221	222

Position :	Ref. Std. ID No.:
1	19RTD-2/1
2	19RTD-2/2
3	19RTD-2/3
4	19RTD-2/4
5	19RTD-2/5
6	24-19RTD-2/6
7	19RTD-2/7
8	19RTD-2/8
9 (ref.)	19RTD-2/9



### Probe Installation Details :

a = 10 cm  
b = 10 cm  
c = 10 cm

### Dimension of Chamber :

D = 0.47 m  
W = 0.65 m  
H = 1.2 m  
Capacity = 0.37 m<sup>3</sup>

เอกสารไม่ควบคุม



Equipment : Incubator  
Condition As-Received : Used Item  
Reference : 2407-0153OC-4  
Result of Calibration :- ( " ) Without Adjustment  
Function of UUC\* : Temperature Source  
Fresh air setting : Not Available

Cert. No.: 24TM638  
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 )
35.0	35.0	35.0	0.030	0.31	0.33	2

Calibration Point ( °C )	Measured Temperature ( °C )									Uncertainty ( ± °C )
	1	2	3	4	5	6	7	8	9 (ref.)	
35.0	35.093	35.011	35.081	35.116	34.840	35.054	34.824	34.978	34.824	0.30

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

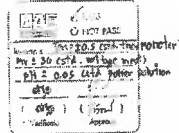


## Certificate of Calibration

Cert.No.: 25CH51  
Page: 1 of 3

Equipment : pH Meter  
Manufacturer : Horiba  
Model : LAQUA-PH210  
Serial No. : HA0E0009  
ID No. : UAE EFM.071/2564(EFM.pH.04/B4)  
Condition As-Received: Used item  
Received Date : 14 January 2025  
Calibration Date : 15 January 2025  
Reference : 2501-0473WSC-1  
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 : Warakorn Lamsagtrakul  
Approved by :   
Approved Signatory  
( ) Ponthippa Tamayakul  
( ) Ponpan Paipim  
(✓) Saithip Meangmai  
Issue Date : 17 January 2025

The Uncertainties are for a confidence probability of approximately 95%  
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Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Cert.No.: 25CH51  
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	54090049	130RC116	24E2759	25 Aug 2025
2) Ref. Standard Thermometer	4982054	110RC044	24/757	14 Jul 2025

- This Certification 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
pH 4.008	CPA chem	1034203	27 Sep 2026
pH 6.999	Hach Lange GmbH	C03220	29 Oct 2026
pH 10.010	CPA chem	1034205	27 Sep 2025

#### 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
	pH	mV	mV	pH	mV	pH		
pH Meter S/N: HA0E0009	4.00	177.46	177.4	4.01	0.058	4.01	0.058	2.00
	7.00	0.00	0.0	7.00	0.058	7.00	0.058	2.00
	7.00	0.00	0.0	7.00	0.058	7.00	0.058	2.00
	10.00	-177.48	-177.3	10.01	0.058	10.01	0.058	2.00



Cert.No.: 25CH51  
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: Q8AG0238	4.008	4.01	174.7	0.0079	2.00
	6.999	7.00	-1.4	0.0096	2.00
	6.999	7.00	-2.0	0.0085	2.00
	10.010	10.01	-175.6	0.0092	2.00

#### Function : Temperature Measurement

(\*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : 9652-10D

- Serial No. : Q8AG0238

Dimension of probe

- Length : 110 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	15.001	15.0	-0.001	0.13	2.00
30.0	30.002	30.0	-0.002	0.13	2.00
45.0	45.004	45.1	0.096	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 %.



## 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 Analysts 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 Pattrapongpaiboon

Approved by:

Kunchit  
Approved Signatory

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

Issue Date: 27 March 2025

The Uncertainties are for a confidence probability of approximately 95%

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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.	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.

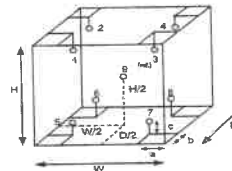
3. This certificate is traceable to the International System of Unit.

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

Result of Calibration: ( ) Without Adjustment

Function of UUC: Temperature Source

Fresh air setting: Close



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<sup>3</sup>

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	( 164 ) °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

เอกสารไม่ควบคุม



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	0.84	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	104.135	104.363	104.317	103.649	103.738	104.179	104.229	104.025	0.42
120.0	119.575	119.368	119.307	119.905	118.994	119.194	119.888	119.994	120.084	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



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

Laboratory Condition: Temperature  $(25 \pm 5) ^\circ\text{C}$   
Humidity  $(50 \pm 20) \%$   
Test Procedure: In - house method : CP-CH9  
by Comparison Technique with Azide Modification Method

Tested by: Welalak Sinthean

Approved by:

Sathip  
Approved Signatory

( ) Chakrit Weewwanjua  
( ) Ponpan Patpin  
(✓) Sathip Meangmal

Issue Date: 18 February 2025

เอกสารไม่ควบคุม



Cert.No.: 25TW28  
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) (mg/L)	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


ใบผลการสอบเทียบ (Verification of Certificate)									
Certificate No.: 25TW29		Equipment: Do Meter		Model: 3100		ID No.: UAE.WAO.004/2564			
Brand : VSI									
Calibration results									
Titration Method	Standard	Do meter	Error%	Corrections	Error	Judgment	(Total Error < Judgement)		
	(mg/L)	Reading (mg/L)	(mg/L)	(mg/L)	(mg/L)	(% mg/L)	(mg/L)	(mg/L)	
	8.22	8.22	0.0000	0.0000	0.0	0.02		pass	

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เอกสารไม่ควบคุม

# FOSS

## Customer Service Report

Date: 15 May 2024	Report No.: 12875		
Job No.: 8315	Customer: UAE		
Instrument: KSA Distiller	Address: Bangkok		
	Serial: 9480139		
Start	Travel To Customer (Hrs) 09:30	Labour (Hrs) 09:30	Travel From Customer (Hrs) 14:30
Finish	09:30	5	15

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

PMA Type	Smartcare		Smartcare Pro		Foscare	
	Smartcare Advance		Foscare Pro		N/A	

Details of Work / Test
- Visual Check
- No leak
- No damage
- Change PM 1/1
- Function Check
- All parts OK
- Receiver N/A
- No problem
Plan = Recover

Part No.	Batch	Description	Qty
6010014	05-01-2024	SM KIT Filter	1

Signed FOSS	Signed Customer
Name	Name

Email:	Customer Contact:
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เอกสารไม่ควบคุม



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



## Calibration Certificate

Certificate No.: 2402283-001-01  
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.  
Address: 3 Soi Udomsuk 41, Sukhumvit Road, Bangchack, Prachinong, Bangkok 10260

Page 1 of 4

Equipment: Electronic Balance

Manufacturer: METTLER TOLEDO

Model: XSR2050U

Serial No.: C009071872

ID No.: UAE.WAO.012/2563

Order No.: 2402283

Operation No.: 2402283-001

Date of Receipt: 2 April 2024

Date of Calibration: 2 April 2024

Calibrated by Mr.Jerawut Prapowuttipong  
Scientist

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

Date of Issue: 9 April 2024

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

เอกสารไม่ควบคุม

## Calibration Report

Certificate No.: 2402283-001-01  
Equipment: Electronic Balance  
Manufacturer: METTLER TOLEDO  
Model: XS205DU  
Resolution: 0.00001 g / 0.0001 g  
Serial No.: 0504071872  
ID No.: UAE.WAS.012/2563  
Capacity: 220 g

Date of Calibration: 2 April 2024 Page 2 of 4

Environment Condition: Ambient Temperature: 24.5 ± 0.5 °C Relative Humidity: 47.5 ± 2.5 %

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

Condition of Equipment: Good Condition

Condition of This Results of Calibration:

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

2. Reference Standard:

Reference Standard	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Standard Weight Case E2	1mg to 200g	8405567572	TCS	M23040335	8 April 2024
Instrument	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Thermo-Hygro Meter	606-H1	NPL8TH 016/23	Quayle Roborn	CA24-0343	9 February 2025

3. This Calibration is traceable to SI UNIT

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

5. The 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)
10	0.0000052
80	0.0000052
100	0.0000048
200	0.0000057

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
(g)	(g)	(g)
100.0002	100.0001	100.0002
99.9999	100.0001	100.0001
(Maximum Difference)		
0.0003		

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

## Calibration Report

Certificate No.: 2402283-001-01  
Equipment: Electronic Balance  
Manufacturer: METTLER TOLEDO  
Model: XS205DU  
Resolution: 0.00001 g / 0.0001 g  
Serial No.: 0504071872  
ID No.: UAE.WAS.012/2563  
Capacity: 220 g

Date of Calibration: 2 April 2024 Page 3 of 4

Calibration Results: (Continued)

Calibration Range: 0 - 80 g

Calibration Adjustment: Internal Calibration

3. Departure from Nominal Value: (Range: 0 - 80 g; Resolution: 0.00001 g)

Nominal Value (g)	Standard Value (g)	Average Reading (g)	Correction (g)	Uncertainty (g)	Coverage Factor (k)
Unloaded	0.000000	0.000000	0.000000	0.00000008	2.00
0.05	0.051003	0.051001	-0.000001	0.00000091	2.00
0.05	0.050500	0.050500	0.000000	0.00000094	2.00
0.01	0.010000	0.010000	0.000000	0.00000091	2.00
0.05	0.049996	0.049996	0.000000	0.00000098	2.00
0.1	0.100011	0.100009	-0.000001	0.0000011	2.00
0.5	0.500016	0.500016	0.000000	0.0000014	2.00
1	1.000002	1.000002	-0.000000	0.0000016	2.00
2	2.000002	2.000001	-0.000001	0.0000017	2.00
5	5.000017	5.000017	0.000000	0.0000020	2.00
10	10.000009	10.000009	0.000000	0.0000026	2.00
20	20.000031	20.000031	0.000000	0.0000027	2.00
30	30.000040	30.000040	0.000000	0.0000032	2.00
50	50.000028	50.000028	-0.000001	0.0000038	2.00
80	80.000008	80.000008	0.000000	0.0000041	2.00

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

## Calibration Report

Certificate No.: 2402283-001-01  
Equipment: Electronic Balance  
Manufacturer: METTLER TOLEDO  
Model: XS205DU  
Resolution: 0.00001 g / 0.0001 g  
Serial No.: 0504071872  
ID No.: UAE.WAS.012/2563  
Capacity: 220 g

Date of Calibration: 2 April 2024 Page 4 of 4

Calibration Results: (Continued)

Calibration Range: 81 - 200 g

Calibration Adjustment: Internal Calibration

3. Departure from Nominal Value: (Range: 81 - 200 g; Resolution: 0.00001 g)

Nominal Value (g)	Standard Value (g)	Average Reading (g)	Correction (g)	Uncertainty (g)	Coverage Factor (k)
90	90.00010	90.00000	-0.00010	0.000015	2.00
100	100.00006	100.00000	-0.00006	0.000015	2.00
110	110.00007	110.00001	-0.00006	0.000017	2.00
120	120.00002	120.00000	-0.00002	0.000018	2.00
130	130.00013	130.00000	-0.00013	0.000019	2.00
140	140.00011	140.00000	-0.00011	0.000020	2.00
150	150.00005	150.00001	-0.00004	0.000020	2.00
160	160.00010	160.00001	-0.00009	0.000022	2.00
170	170.00012	170.00001	-0.00011	0.000023	2.00
200	200.00016	200.00000	-0.00016	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 %.

\*\*\*\*\* End \*\*\*\*\*

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

## Certificate of Calibration

Cert.No.: 24MM292  
Page: 1 of 3

Equipment: Electronic Balance

Manufacturer: Mettler Toledo

Model: AB204-S/FACT

Serial No.: 1129361010

ID No.: UAE.WAS.002/2552

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

Location: Balance Room (10B)

Received order: 11 May 2024

Calibration Date: 11 May 2024

Ambient Temperature: 15 °C to 40 °C

Relative Humidity: 30 % to 80 %

Calibrated by: Khit Rutanaprapachai

Approved by: Kunchit

( ) Ponpan Paipim  
( ) Suwit Injai  
(✓) Kunchit Promprat

Issue Date: 15 May 2024

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.



Equipment : Electronic Balance  
Condition As-Received : Used Item  
Reference : 2405-0168OC-1

Cert.No.: 24MM282  
Page: 2 of 3

Procedure used :- Calibration were conducted using in-house calibration procedure CP-OB01 based on UKAS LAB 14 according to direct measurement method against standard weight.

#### Condition of this result of calibration

##### 1. Reference standard instruments:-

Instruments Model Serial No. ID No. Test report No. Due date  
1) Standard Weight Set (E2) 15B84 24053 70RC007 MM-0013-24 25 Jan 2026

- This certificate is valid only to the item calibrated on date and place of calibration.
- This result of calibration was made on requested at the point specified by customer.
- This certificate is not certified for any commercial transaction.
- This certification is traceable to the International System of Unit.

Result of calibration ( ) Without Adjustment ( \* ) After Adjustment by Internal Calibration

Range capacity : 0 g to 220 g Resolution 0.0001 g

##### Before Adjustment :

Applied Weight (g)	Balance Reading (g)	Correction (g)	Measurement Uncertainty (± mg)	Coverage Factor (k)
100	100.0000	0.0000	0.19	2.03
200	200.0006	-0.0006	0.30	2

##### After Adjustment :

#### 1. Determination of the standard deviation of weighing machine (n = 10)

Applied Weight Standard Deviation

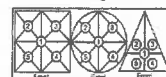
Applied Weight (g)	Standard Deviation of Reading (g)
100	0.00007
200	0.00005

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Equipment : Electronic Balance  
Condition As-Received : Used Item  
Reference : 2405-0168OC-1

Cert.No.: 24MM282  
Page: 3 of 3



Maximum difference between off-center and central loading (g)  
0.0001

#### 2. Effect of off center loading

A mass of 100 g was placed to various position on the pan.  
The weighing machine reading error obtained is given in the table

Position 1 (g)	Position 2 (g)	Position 3 (g)	Position 4 (g)	Position 5 (g)
-0.0004	-0.0004	-0.0003	-0.0003	-0.0004

#### 3. Departure from nominal value

Applied Weight (g)	Balance Reading (g)	Correction (g)	Measurement Uncertainty (± mg)	Coverage Factor (k)
Unload	0.0000	0.0000	0.15	2.13
0.01	0.0100	0.0000	0.15	2.13
0.05	0.0500	0.0000	0.15	2.13
0.1	0.1000	0.0000	0.15	2.13
0.5	0.5000	0.0000	0.15	2.13
1	1.0000	0.0000	0.15	2.13
10	10.0000	0.0000	0.15	2.11
50	49.9999	+0.0001	0.17	2.06
100	99.9999	+0.0001	0.19	2.03
150	149.9998	+0.0002	0.29	2
200	199.9990	+0.0010	0.30	2

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.0-2717-3000-29 FAX.0-2719-9484



## Certificate of Calibration

Cert. No.: 24TM1113  
Page: 1 of 3

Equipment : BOD Incubator  
Manufacturer : ARCO  
Model : UCA-1320  
Serial No. : -  
ID No. : UAE.WAO.002/2550  
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.  
3 Sol Udomsuk 41, Sukhumvit Road,  
Bangchak, Phrakhanong,  
Bangkok 10260  
Location : Lab Floor 2  
Received Order : 11 July 2024  
Calibration Date : 11 July 2024  
Ambient Temperature : (28 ± 10) °C  
Relative Humidity : (50 ± 30) %  
Calibrated by : Tawatchai Pama  
Approved by :   
( ) Ponpan Palpin  
(✓) Suwit Injai  
( ) Kunchit Prompret  
Issue Date : 14 July 2024

The uncertainties are for a confidence probability of approximately 95%

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เอกสารไม่ควบคุม



Equipment : BOD Incubator  
Condition As-Received : Used Item  
Reference : 2407-0243OC-1

Cert. No.: 24TM1113  
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 MY49023632 23LM122 TPA 26 Jul 2024

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

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

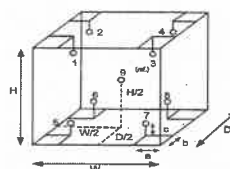
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- ( \* ) Without Adjustment

Function of UUC\* : Temperature Source

Fresh air setting : Not Available

Environment during calibration		
	Beginning	Finished
Temp. (°C)	29	32
REL.Humid. (%)	76	85
AC Supply (Volt)	233	234



Probe Installation Details : Dimension of Chamber :  
a = 10 cm D = 0.82 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	19-16RTD-01
2	19-16RTD-02
3	19-16RTD-03
4	19-16RTD-04
5	19-16RTD-05
6	19-16RTD-06
7	21-16RTD-07
8	19-16RTD-08
9 (ref.)	19-16RTD-09

เอกสารไม่ควบคุม



Equipment : BOD Incubator  
 Condition As-Received : Used Item  
 Reference : 2407-0243OC-1  
 Result of Calibration :- ( \* ) Without Adjustment  
 Function of UUC\* : Temperature Source  
 Fresh air setting : Not Available

Cert. No.: 24TM1113  
 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	19.8	0.85	0.66	1.5	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (±°C)
	Position									
	1	2	3	4	5	6	7	8	9 (ref.)	
20.0	20.210	20.331	20.162	19.645	20.287	20.070	19.838	19.781	19.954	0.79

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)  
 CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES  
 534/4 PATTANAKARN ROAD SOI 18, SUANLIANG, SUANLIANG BANGKOK 10250  
 TEL.0-2717-3000-29 FAX.0-2719-8484



## Certificate of Calibration

Cert.No.: 25CH353  
 Page.: 1 of 3

Equipment : pH Meter  
 Manufacturer : Horiba  
 Model : LAQUA-PH210  
 Serial No. : HA0A0007  
 ID No. : UAE.EFM.002/2563(EFM.pH.02/63)  
 Condition As-Received : Used item  
 Received Date : 18 March 2025  
 Calibration Date : 20 March 2025  
 Reference : 2503-0612WSC-1  
 Submitted by : United Analyst and Engineering Consultant Co.,Ltd.  
 3 Soi Udomsuk 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 : Uthen Kankawi

Approved by :   
 Approved Signatory

( ) Chakrit Waeewanjua  
 ( ) Ponpan Paipim  
 (x) Seithip Meangmai

Issue Date : 20 March 2025

The Uncertainties are for a confidence probability of approximately 95%

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Cert.No.: 25CH353  
 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	43160066	130RC092	24E1320	22 Apr 2025
2) Ref. Standard Thermometer	4962054	110RC044	24I757	14 July 2025

\* This Certification 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
pH 4.007	CPA chem	1069865	18 Jan 2027
pH 6.999	Hach-Lange GmbH	C03220	29 Oct 2026
pH 10.010	CPA chem	1066989	18 Jan 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
	pH	mV	mV	pH		
pH Meter S/N.: HA0A0007	4.00	177.48	177.6	4.01	0.058	2.00
	7.00	0.00	0.3	6.98	0.058	2.00
	7.00	0.00	0.3	6.98	0.058	2.00
	10.00	-177.48	-177.1	10.01	0.058	2.00



Cert.No.: 25CH353  
 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.: 992H0385	4.007	4.00	150.1	0.0085	2.05
	6.999	7.00	-26.1	0.0095	2.00
	6.999	7.00	-26.7	0.011	2.05
	10.010	10.01	-202.4	0.010	2.00

#### Function : Temperature Measurement

( \* ) Without adjustment

This equipment was connected with Temperature Probe;

- Model : 9652

- Serial No. : 992H0385

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	15.006	15.0	-0.006	0.13	2.00
30.0	29.998	30.0	0.002	0.13	2.00
45.0	44.993	45.0	0.007	0.13	2.00

Remark : - UUC\* = Unit Under Calibration

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

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## 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,  
Phrekanhong, 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 Sirithuan  
Approved by : Saithip  
Approved Signatory  
( ) Chakrit Waeewanjua  
( ) Ponpan Palpim  
(✓) Saithip Meangmai  
Issue Date : 18 February 2025

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### 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	24MH131	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) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.22	8.22	0.0055

This report was certified only for the instrument was 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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Thiobacterial medium for nitrification (certified)					
Certificate No.: 25TW29		Equipment: DO Meter		Model: 5100	
Brand: YSI		ID No.: UAE.WAO.004/2554			
Serial No.: 11B 101863					
Calibration results					
Titration Method	Standard Deviation (mg/L)	DO meter Reading (mg/L)	Error% (mg/L)	Correction% (mg/L)	[ Error Total Error (mg/L) ]
8.22	0.0055	8.22	0.0090	0.0090	0.02
Judgement (Total Error < judgement) (mg/L)					
Pass					
Prepared by: [Signature]					
Date: 28.03.2022					
Issued by: [Signature]					
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เอกสารไม่ควบคุม

# FOSS

## Customer Service Report

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

Report No.: 13319

Customer: UAE

Address: Bangkok

Serial: 91790524

Date: Jan 27, 2025

Job No.: 11615

Instrument: KI100

Travel To Customer (Hrs)

Start 09:00

Finish 10:00

Labour (Hrs)

15:00

3

Travel From Customer (Hrs)

15:00

3

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

PMA Type	Smartcare	Smartcare Pro	Foscare
	Smartcare Advance	Foscare Pro	N/A

Details of Work / Test	
Visual Check	OK
DO Meter Calibration	OK
DO Meter Reading	OK
DO Meter Error	OK
DO Meter Correction	OK
DO Meter Total Error	OK
DO Meter Judgment	OK
DO Meter Pass	OK

Part No.	Batch	Description	Qty
100.69965	11-06-2024	DO Meter Kit	1
100.69965	11-06-2024	DO Meter Kit	1
100.69965	11-06-2024	DO Meter Kit	1

I confirm this report is accurate and complete	
Signed FOSS	Signed Customer
Name	Name

Email	Customer Contact
Remark	

เอกสารไม่ควบคุม

FOSS

## Customer Service Report

Date: 24 February 2025

Job No.: 11735

Instrument: XT81 UD

FOSS South East Asia  
3388 Sirinrat Building, 25th - 26th Floor, Unit No. 3388/50,  
Rama IV Road, Klongtoey, Klongtoey, Bangkok, Thailand 10110

Report No.: 13854

Customer: UAE

Address: Bangkok

Serial: 91897052

Travel To Customer (hrs)  
8:30 - 9:00  
9:00 - 9:30Labour (hrs)  
09:00 - 10:00  
10:00 - 11:00Travel from Customer (hrs)  
15:00 - 16:00  
16:00 - 17:00

Application	Special	Job Type	Standard
Distributor	Courtesy Visit	Installation	Training
Digital Service	PMA Onboarding	Quote	In House
Internal	Warranty	Repair	PM
Investigate	Sales Support	Remote	Health Check Visit

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

Details of Work / Task
2-PM 14:00 - 14:30
- 1st test before PMA
- cleaning before 30 min before
- filling before 10 min
- test operation
- calibration 80 - 100 °C
- calibration 150 - 180 °C
- check 60 - 80 °C
- All pass

Instrument Ready for Use ☐ OK ☒ Not OK ☐

Part No.	Batch	Description	Qty
60031810	01-01-2024	FOSS XT81 UD 1400 500 500	1

I confirm this report is accurate and complete

Signed FOSS Signed Customer

Name: N. N. N. Name: S. S. S.

Email: Customer Contact:

\*Remark:

Please scan QR code



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



## Calibration Certificate

Certificate No.: 2500116-001-01

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

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

Page 1 of 3

Equipment: CHAMBER (Hot Air Oven)

Manufacturer: MEMMERT

Model: UF55

Serial No.: B216.1666

ID No.: UAE.WAO.027/2559

Order No.: 2500116

Operation No.: 2500116-001

Date of Receipt: 8 October 2024

Date of Calibration: 8 October 2024

Calibrated by Mr.Yothin Charoensuk  
ScientistApproved by   
(Mr. Phengphet Tuanjit)  
Manager, Division of Calibration Laboratory  
Responsible for the Technical Management Team

Date of Issue: 15 October 2024

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



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



## Calibration Report

Certificate No.: 2500116-001-01

Equipment: CHAMBER (Hot Air Oven)

Model: UF55 Serial No.: B216.1666

Resolution: 0.1 °C ID No.: UAE.WAO.027/2559

Manufacturer: MEMMERT

Date of Calibration: 8 October 2024

Page 2 of 3

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

Environment Condition:  
Ambient Temperature ( 30.3 ± 1 ) °C  
Relative Humidity ( 55 ± 1 ) %  
Line Voltage ( 230 ± 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.

## 2. Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MYS7003188	TE 670485-01	8 June 2025	NATIONAL FOOD INSTITUTE
RTD		CH201-209/RTD201-209			

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

## UUC Description :

Time of Record 1 Hour 9 Minute At 104.0,140.0 and 180.0 °C

Fresh air Damper ☐ Open Position ☐ Close Fan 40%☐ Not Available7. Result of Calibration : ☒ Without adjustment ☐ After adjustment

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

เอกสารไม่ควบคุม

เอกสารไม่ควบคุม (Non-Controlled Document) : เอกสารที่จัดทำขึ้นเพื่อใช้ในการปฏิบัติงาน แต่ไม่จำเป็นต้องมีการควบคุมเอกสาร  
เอกสารไม่ควบคุม (Non-Controlled Document) : เอกสารที่จัดทำขึ้นเพื่อใช้ในการปฏิบัติงาน แต่ไม่จำเป็นต้องมีการควบคุมเอกสาร  
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มูลนิธิพัฒนาอุตสาหกรรม  
Foundation for Industrial Development National Food Institute  
Food Industrial Laboratory Service Center



## Calibration Report

Certificate No.: 2500116-001-01

Equipment: CHAMBER (Hot Air Oven)

Model: UF55 Serial No.: B216.1666

Resolution: 0.1 °C ID No.: UAE.WAO.027/2559

Manufacturer: MEMMERT

Date of Calibration: 8 October 2024

Page 3 of 3

Calibration point: 104.0,140.0 and 180.0 °C

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volts)
MIN	29.3	54	227.0
MAX	31.2	56	232.0

Table 1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
104.0	103.89	103.66	103.88	103.89	104.40	103.98	103.70	104.10	104.15	0.53
140.0	139.65	139.53	139.87	139.88	140.67	140.00	139.60	140.25	140.23	0.73
180.0	179.63	179.22	179.71	179.76	181.03	180.06	179.41	180.87	180.39	0.90

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
104.0	104.0	104.0	104.6	0.15	0.49	0.88
140.0	140.0	140.0	140.0	0.13	0.71	1.2
180.0	180.0	180.0	180.0	0.13	1.2	1.9

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 -----

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

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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, Prakhong, 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 Charoen Suk Scientist  
Approved by N. Nijphat (Mr.Pheraphat Tuanjit) Manager, Division of Calibration Laboratory  
Responsible for the Technical Management Team  
Date of Issue: 25 March 2025

The uncertainties are for a confidence probability of approximately 95%

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

เอกสารนี้จัดทำขึ้นเพื่อรับรองผลการสอบเทียบของเครื่องชั่งอิเล็กทรอนิกส์รุ่น XSR205DU ของบริษัท UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD. โดยมีข้อมูลรายละเอียดการสอบเทียบและผลการสอบเทียบปรากฏในเอกสารแนบมา  
เอกสารนี้จัดทำขึ้นเพื่อรับรองผลการสอบเทียบของเครื่องชั่งอิเล็กทรอนิกส์รุ่น XSR205DU ของบริษัท UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD. โดยมีข้อมูลรายละเอียดการสอบเทียบและผลการสอบเทียบปรากฏในเอกสารแนบมา

## Calibration Report

Certificate No.: 2502226-001-01  
Equipment: Electronic Balance  
Manufacturer: METTLER TOLEDO  
Model: XSR205DU  
Serial No.: C009071872  
Capacity: 82 g / 220 g  
Resolution: 0.00001 g / 0.0001 g  
ID No.: UAE.WAO.012/2563

Page 2 of 4

Date of Calibration: 20 March 2025  
Environment Condition: Ambient Temperature: 21.2 °C Relative Humidity: 46 ± 3.5 %  
Place of Calibration: 289 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-NA-001 In-House Method based on URAS Lab 14 : 2019

2. Reference Standards:

Reference Standard Model Serial No. Calibrated By Certificate No. Due Date  
Standard Weight Class E2 1mg to 100g 850567572 TCS M24043005 19 April 2025

Instrument Model Serial No. Calibrated By Certificate No. Due Date  
Thermo-Hygro Meter 608-H1 NFI.5TH 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	0.000052
80	0.000042
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)
100.0001	100.0001	100.0001	100.0001	100.0001	100.0002	0.0001

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

เอกสารนี้จัดทำขึ้นเพื่อรับรองผลการสอบเทียบของเครื่องชั่งอิเล็กทรอนิกส์รุ่น XSR205DU ของบริษัท UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD. โดยมีข้อมูลรายละเอียดการสอบเทียบและผลการสอบเทียบปรากฏในเอกสารแนบมา  
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## Calibration Report

Certificate No.: 2502226-001-01  
Equipment: Electronic Balance  
Manufacturer: METTLER TOLEDO  
Model: XSR205DU  
Serial No.: C009071872  
Capacity: 82 g / 220 g  
Resolution: 0.00001 g / 0.0001 g  
ID No.: UAE.WAO.012/2563

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
Unloaded	0.00000	0.00000	0.00000	0.0000089	2.00
0.001	0.001003	0.00100	0.00000	0.0000062	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	0.050006	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	1.000023	1.00001	-0.00001	0.000016	2.00
2	2.000071	2.00005	-0.00002	0.000017	2.00
5	5.000115	5.00005	-0.00006	0.000021	2.00
10	10.000089	10.00005	-0.00004	0.000026	2.00
20	20.000530	20.00012	-0.00041	0.000037	2.00
30	30.000339	30.00012	-0.00022	0.000050	2.00
50	50.000218	50.00011	-0.00011	0.000068	2.00
80	80.000047	80.00020	0.00015	0.00011	2.00

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

เอกสารนี้จัดทำขึ้นเพื่อรับรองผลการสอบเทียบของเครื่องชั่งอิเล็กทรอนิกส์รุ่น XSR205DU ของบริษัท UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD. โดยมีข้อมูลรายละเอียดการสอบเทียบและผลการสอบเทียบปรากฏในเอกสารแนบมา  
เอกสารนี้จัดทำขึ้นเพื่อรับรองผลการสอบเทียบของเครื่องชั่งอิเล็กทรอนิกส์รุ่น XSR205DU ของบริษัท UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD. โดยมีข้อมูลรายละเอียดการสอบเทียบและผลการสอบเทียบปรากฏในเอกสารแนบมา

## Calibration Report

Certificate No.: 2502226-001-01  
Equipment: Electronic Balance  
Manufacturer: METTLER TOLEDO  
Model: XSR205DU  
Serial No.: C009071872  
Capacity: 82 g / 220 g  
Resolution: 0.00001 g / 0.0001 g  
ID No.: UAE.WAO.012/2563

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
90	90.00019	90.00002	-0.00017	0.000015	2.00
100	100.00005	100.00001	-0.00004	0.000016	2.00
110	110.00007	110.00001	-0.00006	0.000017	2.00
120	120.00009	120.00002	-0.00007	0.000018	2.00
130	130.00010	130.00002	-0.00008	0.000019	2.00
140	140.00013	140.00002	-0.00011	0.000019	2.00
150	150.00009	150.00002	-0.00007	0.000021	2.00
160	160.00010	160.00002	-0.00008	0.000022	2.00
170	170.00012	170.00002	-0.00010	0.000023	2.00
200	200.00013	200.00002	-0.00011	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 %.

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

เอกสารนี้จัดทำขึ้นเพื่อรับรองผลการสอบเทียบของเครื่องชั่งอิเล็กทรอนิกส์รุ่น XSR205DU ของบริษัท UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD. โดยมีข้อมูลรายละเอียดการสอบเทียบและผลการสอบเทียบปรากฏในเอกสารแนบมา  
เอกสารนี้จัดทำขึ้นเพื่อรับรองผลการสอบเทียบของเครื่องชั่งอิเล็กทรอนิกส์รุ่น XSR205DU ของบริษัท UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD. โดยมีข้อมูลรายละเอียดการสอบเทียบและผลการสอบเทียบปรากฏในเอกสารแนบมา

## Calibration Certificate

**Certificate No.:** 2502229-006-01  
**Client name:** UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.  
**Address:** 3 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Prakhong, Bangkok 10260

Page 1 of 2

**Equipment:** CHAMBER (Incubator)

**Manufacturer:** BINDER

**Model:** KB 400

**Serial No.:** 2020000015535

**ID No.:** UAE.MIC.018/2564

**Order No.:** 2502229

**Operation No.:** 2502229-006

**Date of Receipt:** 19 March 2025

**Date of Calibration:** 19 March 2025

**Calibrated by:** Mr.Jerawut Prapawuttipong  
Scientist

**Approved by:** *P. Jangphait*  
(Mr.Pheraphat Tuanjit) (fn)  
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

2006 เทคโนโลยีการส่งเสริมและพัฒนาอุตสาหกรรม  
ศูนย์บริการและทดสอบมาตรฐานอาหาร  
306 Soi 36, Anuram Road, Bang Khen Suburban, Bang Phe District, Bangkok 10710, Thailand  
Tel: 0-2622-8655 Fax: 0-2622-8654

เอกสารไม่ควบคุม



## Calibration Report

**Certificate No.:** 2502229-006-01  
**Equipment:** CHAMBER (Incubator)  
**Model:** KB 400 **Serial No.:** 2020000015535  
**Resolution:** 0.1 °C **ID No.:** UAE.MIC.018/2564  
**Manufacturer:** BINDER

**Date of Calibration:** 19 March 2025

Page 2 of 3

**Location:** LABORATORY, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.  
**Environment Condition:**  
Ambient Temperature ( 19 ± 1 ) °C  
Relative Humidity ( 50 ± 5 ) %  
Line Voltage ( 223 ± 3 ) 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 TLA5 G-20-1/02-08 (E); Guidelines for Calibration and Checks of Temperature Controlled Enclosures.  
- The temperature scale used was based on ITS - 90.  
- All data show below were final values and the initial data may be obtained upon request.

### 2. Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY49016851	TE 670477-01	4 May 2025	NATIONAL FOOD INSTITUTE
	RTD	(D-3M-10) (470477-03)			

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

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

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

- Condition of Calibrated item : Good

### UUC Description :

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

- Result of Calibration : ☒ Without adjustment ☐ After adjustment

*P. Jangphait*  
25 March 2025

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

2006 เทคโนโลยีการส่งเสริมและพัฒนาอุตสาหกรรม  
ศูนย์บริการและทดสอบมาตรฐานอาหาร  
306 Soi 36, Anuram Road, Bang Khen Suburban, Bang Phe District, Bangkok 10710, Thailand  
Tel: 0-2622-8655 Fax: 0-2622-8654

เอกสารไม่ควบคุม



## Calibration Report

**Certificate No.:** 2502229-006-01  
**Equipment:** CHAMBER (Incubator)  
**Model:** KB 400 **Serial No.:** 2020000015535  
**Resolution:** 0.1 °C **ID No.:** UAE.MIC.018/2564  
**Manufacturer:** BINDER

**Date of Calibration:** 19 March 2025

Page 3 of 3

**Calibration point:** 35.0 °C

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	17.1	45	220.0
MAX	19.1	55	225.0

Table 1 : Reporting of Temperature

Calibration point (°C)	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Uncertainty ± (°C)
35.0	34.98	35.17	34.99	34.92	35.18	35.01	35.00	35.13	35.00	34.96	35.02	35.17	35.04	0.27

Table 2 : Reporting of Characterization Result

UUC <sup>a</sup> Setting (°C)		UUC <sup>a</sup> Reading (°C)		Temperature Stability ± (°C)	Temperature Uniformity (°C)	Overall Variation (°C)
(°C)	MIN	MAX	Average			
35.0	35.0	35.0	35.0	0.029	6.15	0.30

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

UUC = Unit Under Calibration

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

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

Overall Variation = The difference of the maximum and minimum measured temperatures 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 -----

*P. Jangphait*  
25 March 2025

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

2006 เทคโนโลยีการส่งเสริมและพัฒนาอุตสาหกรรม  
ศูนย์บริการและทดสอบมาตรฐานอาหาร  
306 Soi 36, Anuram Road, Bang Khen Suburban, Bang Phe District, Bangkok 10710, Thailand  
Tel: 0-2622-8655 Fax: 0-2622-8654

เอกสารไม่ควบคุม



**TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)**  
CORPORATE SERVICES 2: EQUIPMENT CALIBRATION AND TESTING SERVICES  
534/4 PATTANAKARN ROAD SOI 18, SUANLIANG, SUANLIANG BANGKOK 10250  
TEL.0-2717-8000-29 FAX.0-2719-4844

## Certificate of Calibration

**Cert. No.:** 24TM884  
**Page :** 1 of 3

**Equipment :** Incubator

**Manufacturer :** Binder

**Model :** KB 400

**Serial No. :** 20220000000391

**ID No. :** UAE.MIC.029/2565

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

**Location :** Microbiology Laboratory

**Received Order :** 07 June 2024

**Calibration Date :** 07 June 2024

**Ambient Temperature :** ( 28 ± 10 ) °C

**Relative Humidity :** ( 50 ± 30 ) %

**Calibrated by :** Tawatchai Pama

**Approved by :** *Kunchit*  
Approved Signatory

- ( ) Ponpan Palpm  
( ) Suwit Injai  
(✓) Kunchit Promrat

**Issue Date :** 11 June 2024

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 2: Equipment Calibration and Testing Services.

เอกสารไม่ควบคุม





Cert.No.: 25CH353  
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	43160066	130RC092	24E1320	22 Apr 2025
2) Ref. Standard Thermometer	4982054	110RC044	24I757	14 July 2025

- This Certification 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	Manufacturer	Lot No.	Exp. date
pH 4.007	CPA chem	1066665	18 Jan 2027
pH 6.999	Hach Lenge GmbH	C03220	29 Oct 2026
pH 10.010	CPA chem	1066689	18 Jan 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
	pH	mV	mV	pH		
pH Meter S/N.: HA0A007	4.00	177.48	177.6	4.01	0.058	2.00
	7.00	0.00	0.3	6.98	0.058	2.00
	7.00	0.00	0.3	6.98	0.058	2.00
	10.00	-177.48	-177.1	10.01	0.058	2.00



Cert.No.: 25CH353  
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.: 992H0365	4.007	4.00	150.1	0.0085	2.05
	6.999	7.00	-26.1	0.0095	2.00
	6.999	7.00	-26.7	0.011	2.05
	10.010	10.01	-202.4	0.010	2.00

##### Function : Temperature Measurement

(°) Without adjustment

This equipment was connected with Temperature Probe;

- Model : 9652

- Serial No. : 992H0365

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	15.006	15.0	-0.006	0.13	2.00
30.0	29.998	30.0	0.002	0.13	2.00
45.0	44.993	45.0	0.007	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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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES  
534/4 PATTANAKARN ROAD 501 18, SUANLUANG, SUANLUANG BANGKOK 10259  
TEL. 0-2717-3009 FAX. 0-2719-9494

## 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, Bangkok,  
Phraekhanong, 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 : Waleak Sirithan

Approved by :

*Saithip*  
Approved Signatory

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

Issue Date : 18 February 2025

เอกสารไม่ควบคุม



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) (mg/L)	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

-00-

เอกสารไม่ควบคุม

Unit Analyst and Engineering Consultant Co., Ltd.					
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 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 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

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.CAL.006 In-House Method based on UKAS Lab 14 : 2022

Reference Standard	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Standard Weight: Class E2 (CML)	1 mg to 1 kg	8749109122	AMARC	25-009359	Mettler-Toledo	21-Jan-27
Standard Weight: Class F1 (CML)	1 mg to 200 g	11119512	AMARC	24-013690	Mettler-Toledo	04-Feb-26
Instrument	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Thermo-Hydro-Baro Meter	MHB-3825D	AR-46457	SUCCESS	SG-H-00997/67	Success Gateway	21-Nov-25
Thermo-Hydro-Baro Meter	MHB-3825D	AR-46457	TPA	25P992	TPA	25-Feb-24

- This certification is traceable to SI Unit
- This result of calibration was found accurate as shown on date and place of calibration only.
- 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 position 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)
100.0000	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  
Model: AB204-S/FACT  
Serial No.: 1129361010  
Max. Capacity: 220 g  
Calibration Date: April 23, 2025

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

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
Unloaded	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	0.16	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
	100.000169	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%.

o-o-End-o-o

เอกสารไม่ควบคุม

## Calibration Certificate

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

Page 1 of 4

Equipment: Electronic Balance

Manufacturer: METTLER TOLEDO

Model: XSR20SDU

Serial No.: C099071872

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

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

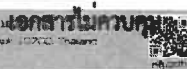
Date of Issue: 25 March 2025

The uncertainties are for a confidence probability of approximately 95%

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-019 Revision: 01 Date: 20-04-65

2502226-001-01: เครื่องชั่งน้ำหนักอิเล็กทรอนิกส์, แบบพกพา, รุ่น XSR20SDU, บริษัท ยูไนเต็ด แอนะลิซต์ และ วิศวกรที่ปรึกษา จำกัด (มหาชน) 301 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110 Thailand  
301 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110 Thailand  
โทร: 02-042-8545 โทร: 02-042-8545



## Calibration Report

Certificate No.: 2502226-001-01  
Equipment: Electronic Balance  
Model: XSR20SDU  
Serial No.: C099071872  
Capacity: 82 g / 220 g  
Manufacturer: METTLER TOLEDO  
Resolution: 0.00001 g / 0.0001 g  
ID No.: UAE.WAO.012/2563

Page 2 of 4

Date of Calibration: 20 March 2025

Environment Condition: Ambient Temperature: 21.2 ± 0.5 °C Relative Humidity: 46 ± 3.5 %

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

Condition of Equipment: Good Condition

Condition of This Result of Calibration:

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

2. Reference Standard:

Reference Standard	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Standard Weight Class E2	1mg to 200g	B59597572	TCS	M2404005	19 April 2025
Instrument	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Thermo-Hygro Meter	608 HI	NFI 57H-017/23	Quality Reborn	(K)25-0542	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	0.000052
80	0.000042
100	0.000009
200	0.000040

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

2502226-001-01: เครื่องชั่งน้ำหนักอิเล็กทรอนิกส์, แบบพกพา, รุ่น XSR20SDU, บริษัท ยูไนเต็ด แอนะลิซต์ และ วิศวกรที่ปรึกษา จำกัด (มหาชน) 301 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110 Thailand  
301 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110 Thailand  
โทร: 02-042-8545 โทร: 02-042-8545

*N. Nijphat*

nfi.co.th

## Calibration Report

Certificate No.: 2502226-001-01  
Equipment: Electronic Balance  
Model: XSR20SDU  
Serial No.: C099071872  
Capacity: 82 g / 220 g  
Manufacturer: METTLER TOLEDO  
Resolution: 0.00001 g / 0.0001 g  
ID No.: UAE.WAO.012/2563

Page 3 of 4

Date of Calibration: 20 March 2025

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	Standard Value	Average Reading	Correction	Uncertainty	Coverage Factor
(g)	(g)	(g)	(g)	(g)	k
Unloaded	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	0.010002	0.010000	0.000000	0.0000091	2.00
0.05	0.050005	0.050000	0.000000	0.0000093	2.00
0.1	0.100011	0.100000	0.000000	0.0000091	2.00
0.5	0.500016	0.500000	0.000000	0.0000094	2.00
1	1.000023	1.000001	-0.000001	0.0000096	2.00
2	2.000023	2.000005	-0.000005	0.0000097	2.00
5	5.000015	5.000005	-0.000003	0.0000094	2.00
10	10.000009	10.000005	-0.000001	0.0000096	2.00
20	20.000030	20.000012	-0.000009	0.0000137	2.00
30	30.000039	30.000012	-0.000009	0.0000150	2.00
50	50.000023	50.000011	-0.000001	0.0000068	2.00
80	80.000067	80.000029	-0.000013	0.000011	2.00

*N. Nijphat*

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

2502226-001-01: เครื่องชั่งน้ำหนักอิเล็กทรอนิกส์, แบบพกพา, รุ่น XSR20SDU, บริษัท ยูไนเต็ด แอนะลิซต์ และ วิศวกรที่ปรึกษา จำกัด (มหาชน) 301 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110 Thailand  
301 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110 Thailand  
โทร: 02-042-8545 โทร: 02-042-8545



## Calibration Report

Certificate No.: 2502226-001-01  
Equipment: Electronic Balance  
Model: XSR20SDU  
Serial No.: C099071872  
Capacity: 82 g / 220 g  
Manufacturer: METTLER TOLEDO  
Resolution: 0.00001 g / 0.0001 g  
ID No.: UAE.WAO.012/2563

Page 4 of 4

Date of Calibration: 20 March 2025

Calibration Results: (Continued)

Calibration Range: >80-200 g

Calibration Adjustment: Internal Calibration

3. Departure from Nominal Value: (Range: >80 - 200 g; Resolution: 0.00001 g)

Nominal Value	Standard Value	Average Reading	Correction	Uncertainty	Coverage Factor
(g)	(g)	(g)	(g)	(g)	k
90	90.000019	90.000002	-0.000001	0.0000095	2.00
100	100.000095	100.000001	0.000000	0.0000096	2.00
110	110.000047	110.000001	0.000000	0.0000097	2.00
120	120.000095	120.000002	-0.000001	0.0000098	2.00
130	130.000010	130.000002	-0.000001	0.0000099	2.00
140	140.000012	140.000002	-0.000001	0.0000099	2.00
150	150.000095	150.000002	-0.000001	0.0000099	2.00
160	160.000010	160.000002	-0.000001	0.0000097	2.00
170	170.000012	170.000002	-0.000001	0.0000097	2.00
200	200.000012	200.000002	-0.000001	0.0000098	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 -----

*N. Nijphat*

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

2502226-001-01: เครื่องชั่งน้ำหนักอิเล็กทรอนิกส์, แบบพกพา, รุ่น XSR20SDU, บริษัท ยูไนเต็ด แอนะลิซต์ และ วิศวกรที่ปรึกษา จำกัด (มหาชน) 301 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110 Thailand  
301 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110 Thailand  
โทร: 02-042-8545 โทร: 02-042-8545

nfi.co.th



## Certificate of Calibration

Cert. No.: 24TM884  
Page : 1 of 3

Equipment : Incubator  
Manufacturer : Binder  
Model : KB 400  
Serial No. : 2022000000391  
ID No. : UAE.MIC.029/2565  
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.  
3 Sol Udomsuk 41, Sukhumvit Road,  
Bangchak, Phrakhanong,  
Bangkok 10280  
Location : Microbiology Laboratory  
Received Order : 07 June 2024  
Calibration Date : 07 June 2024  
Ambient Temperature :  $(28 \pm 10) ^\circ\text{C}$   
Relative Humidity :  $(50 \pm 30) \%$   
Calibrated by : Tawatichai Pama  
Kunchit  
Approved by :  
( ) Ponpan Palpim  
( ) Suwit Imjai  
(✓) Kunchit Promprat  
Issue Date : 11 June 2024

The uncertainties are for a confidence probability of approximately 95%  
This certificate may not be reproduced either in full, except with the prior written  
Approval of the head of Corporate Services : Equipment Calibration and Testing Services.

เอกสารไม่ควบคุม



Equipment : Incubator  
Condition As-Received : Used Item  
Reference : 2406-01900C-2  
Procedure Used :-

Cert. No.: 24TM884  
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

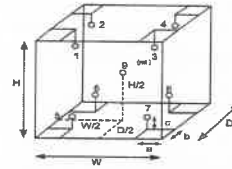
#### 1. Reference standard instrument:

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY49001451	24LM44	TPA	17 Mar 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		
Temp. ( °C )	Beginning	Finished
REL.Humid. ( % )	21	19
AC Supply ( Volt )	77	75
	228	229

Position :	Ref. Std. ID No.:
1	19RTD-2/1
2	19RTD-2/2
3	19RTD-2/3
4	19RTD-2/4
5	19RTD-2/5
6	24-19RTD-2/6
7	19RTD-2/7
8	19RTD-2/8
9 (ref.)	19RTD-2/9

Probe Installation Details :  
a = 10 cm  
b = 10 cm  
c = 10 cm  
Dimension of Chamber :  
D = 0.50 m  
W = 0.65 m  
H = 1.2 m  
Capacity = 0.39 m<sup>3</sup>

เอกสารไม่ควบคุม



Equipment : Incubator  
Condition As-Received : Used Item  
Reference : 2406-01900C-2  
Result of Calibration :- ( \* ) Without Adjustment  
Function of UUC\* : Temperature Source  
Fresh air setting : Close

Cert. No.: 24TM884  
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
35.0	35.0	35.0	0.028	0.28	0.53	2

Calibration Point ( °C )	Measured Temperature ( °C )									Uncertainty ( ± °C )
	1	2	3	4	5	6	7	8	9 (ref.)	
35.0	35.317	35.184	35.142	35.064	35.088	35.093	34.894	34.826	35.056	0.30

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 %.

-00-

เอกสารไม่ควบคุม

### กำหนดจุดห้ามใช้งาน

References Certificate Number. : 24TM884

Equipment : Incubator

Model : KB 400

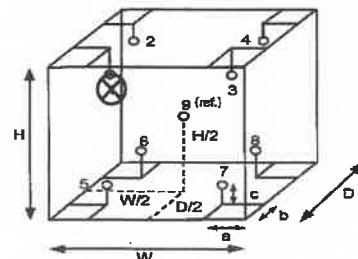
Serial No. : 20220000000391

ID No. : UAE.MIC.029/2565

Manufacturer : Binder

Calibration Point : 35.0 °C

Unit Under Calibration Setting : 35.0 °C



รูปภาพเครื่องมือ แสดงจุดที่ได้รับการสอบเทียบ และสัญลักษณ์ ⊗ แสดงจุดห้ามใช้งาน

กำหนดจุดห้ามใช้งานตำแหน่งที่.....1.....

หมายเลข เก็บใบแนบ...../.....

Use: netapp\Netapp\_LAB\lab-INSTRUMENT 01-24\ACCertificateฉบับนี้ใช้สำหรับสอบเทียบเครื่องมือ 2567 กำหนดจุดห้ามใช้งาน

เอกสารไม่ควบคุม



## Certificate of Calibration

Cert.No.: 25CH262  
Page: 1 of 3

Equipment : pH Meter  
Manufacturer : Horiba  
Model : LAQUA-PH210  
Serial No. : HA1L0035  
ID No. : UAE.EFM.011/2365(EFM.pH.01/65)  
Condition As-Received: Used Item  
Received Date : 25 February 2025  
Calibration Date : 26 to 28 February 2025  
Reference : 2502-0783WSC-2  
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.  
3 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Phrakhanong, Bangkok 10280  
  
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 Lemgagrakul  
  
Approved by : \_\_\_\_\_  
Approved Signatory  
( ) Chakrit Waewwanjua  
( ) Ponpan Palpm  
(✓) Sathip Meangmai  
Issue Date : 26 February 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.: 25CH262  
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	24E2759	25 Aug 2025
2) Ref. Standard Thermometer	4982054	110RC044	24I757	14 July 2025

- This Certification 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
pH 4.007	CPA chem	1066665	18 Jan 2027
pH 6.999	Hach Lange GmbH	C03220	28 Oct 2026
pH 10.010	CPA chem	1066669	18 Jan 2025

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
	pH	mV	mV	pH		
pH Meter S/N.: HA1L0035	4.00	177.48	177.5	4.01	0.058	2.00
	7.00	0.00	0.1	7.02	0.058	2.00
	7.00	0.00	0.1	7.02	0.058	2.00
	10.00	-177.48	-177.4	10.01	0.329	4.53



Cert.No.: 25CH262  
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	178.3	0.0085	2.05
	6.999	7.00	2.3	0.0092	2.00
	6.999	7.00	2.4	0.0092	2.00
	10.010	10.01	-172.2	0.0092	2.00

#### Function : Temperature Measurement

(\*) Without adjustment

This equipment was connected with Temperature Probe,

- Model : \_\_\_\_\_  
- Serial No. : \_\_\_\_\_  
Dimension of probe  
- Length : 110 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	15.003	15.0	-0.003	0.13	2.00
30.0	30.004	30.0	-0.004	0.13	2.00
45.0	45.002	45.0	-0.002	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 %.



## 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, Bangkok,  
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 Sirithan  
Approved by :   
Approved Signatory  
( ) Chakrit Waewwanjua  
( ) Ponpan Palpim  
(✓) Salthip Meangmal  
Issue Date : 18 February 2025

เอกสารไม่ควบคุม



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	99.8%


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)
8.22	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

-00-

เอกสารไม่ควบคุม

Verification of Certificate									
Certificate No.: 25TW29									
Brand : YSI									
Serial No. : 11B 101863									
Model : 5100									
Equipment : DO Meter									
ID No.: UAE.WAO.004/2554									
Calibration results									
Titration Method	Standard Deviation	Do meter Reading	Error%	Correction%	Total Error	Judgment	Trial Error < Judgment		
(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		
Signature:  Date: 18 Feb 2025									

เอกสารไม่ควบคุม

# FOSS

## Customer Service Report

Date:	July 5, 2024		
Job No.:	8315		
Instrument:	Kit 6 Dissolver		
Start	09:30		
Finish	10:30		
Travel To Customer (Hrs)	1		
Labour (Hrs)	1		
Travel From Customer (Hrs)	1.5		
Application	Special	Standard	
Distributor	Courtesy Visit	Installation	
Digital Service	PMA Onboarding	Quote	
Internal	Warranty	Repair	
Investigate	Sales Support	Remote	
		Health Check Visit	
PMA Type	Smartcare	Smartcare Pro	Fosscore
	Smartcare Advance	Fosscore Pro	N/A
Details of Work / Test			
- Visual Check - + No leak + No damage			
- Change Kit x 1 kit			
- Function Check - + Dissolve Rate + Accuracy + Precision + Reproducibility + Stability + Noise			
Result = Follow up, Dissolve Rate 100% DP = 100%			
Instrument Ready for Use			
Part No.	Batch	Description	Qty
01-01-0101	01-01-0101	Kit 6 Dissolver	1
I confirm this report is accurate and complete			
Signed FOSS	Signed Customer		
Name	Name		
Email:	Customer Contact:		
*Remark:			

เอกสารไม่ควบคุม

## 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, Phra 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: Sumit Chotmok

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 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  
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 UMAS Lab. 14 - 2022

#### 2. Reference Standards:

Reference Standard:	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Standard Weight Class E2 (KCAL)	1 mg to 1 kg	8749109102	ANARC	25-019359	Mettler Toledo	21-Jan-27
Standard Weight Class F1 (KCAL)	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-Hydro-Balance Meter	MHB-38250	AK-66457	SUKCESS	SG-14-02021751	SUKCESS Gateway	21-Nov-25
Thermo-Hydro-Balance Meter	MHB-38250	AK-66457	TPA	25P795	TPA	25-Feb-26

3. This Certificate 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.

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

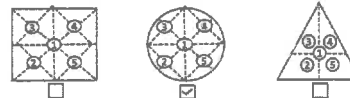
#### Calibration Results:

##### 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 position on pan  
The Balance reading obtained is given in the table.



1 (g)	2 (g)	3 (g)	4 (g)	5 (g)	Minimum 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	1.0000195	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	100.000106	99.9999	0.0002	0.17	2.00
120	120.000115	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
	60.000056	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%.

o-o-End-o-o

เอกสารไม่ควบคุม

## Calibration Certificate

Certificate No.: 2502226-001-01  
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.  
Address: 3 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Phra Khanong, 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.Yoshin Charonsuk  
Scientist

Approved by   
(Mr. Phraphat Tuenjit)  
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

เอกสารไม่ควบคุม



ศูนย์บริการทดสอบและมาตรฐานอาหาร  
Food Industrial Laboratory Service Center



## Calibration Report

Certificate No.: 2502226-001-01

Equipment:

Electronic Balance

Manufacturer: METTLER TOLEDO

Model: XSR205DU

Resolution: 0.00001 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 2 of 4

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

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

Condition of Equipment: Good Condition

Condition of This Results of Calibration:

1. Calibration Method: NFI Method W-NA-001 In-House Method based on UKAS Lab 14 : 2015

2. Reference Standards:

Reference Standard	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Standard Weight Class E2	1mg to 200g	B505567572	TCS	M24041005	19 April 2025
Instrument	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Thermo-Hygro Master	688-HI	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. The result of calibration was found accurate as shown on date and place of calibration only.

Calibration Results:

1. Repeatability of Readings:

Nominal Value (g)	Standard Deviation of Reading (g)
40	0.0000052
80	0.0000042
160	0.0000008
200	0.0000006

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.

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

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

2000 ถนนพหลโยธิน แขวงจตุจักร เขตจตุจักร กรุงเทพฯ 10200 ประเทศไทย  
2000 3rd Fl. Anu-Armit Road, Bang Yai, Nakhon Si Thammarat, Bangkok 10200, Thailand  
Tel: +662-042-06581 Fax: +662-042-06582



ศูนย์บริการทดสอบและมาตรฐานอาหาร  
Food Industrial Laboratory Service Center



## Calibration Report

Certificate No.: 2502226-001-01

Equipment:

Electronic Balance

Manufacturer: METTLER TOLEDO

Model: XSR205DU

Resolution: 0.00001 g / 0.0001 g

Serial No.: C09071872

ID No.: UAE.WAO.012/2563

Capacity: 82 g / 220 g

Date of Calibration: 29 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	Standard Value	Average Reading	Correction	Uncertainty	Coverage Factor
Uncert	0.000000	0.00000	0.00000	0.0000009	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	0.0000051	2.00
0.05	0.049996	0.05000	0.00000	0.0000096	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	10.000005	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	50.000026	50.00014	-0.00012	0.000066	2.00
80	80.000067	80.00010	-0.00013	0.000111	2.00

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

2000 ถนนพหลโยธิน แขวงจตุจักร เขตจตุจักร กรุงเทพฯ 10200 ประเทศไทย  
2000 3rd Fl. Anu-Armit Road, Bang Yai, Nakhon Si Thammarat, Bangkok 10200, Thailand  
Tel: +662-042-06581 Fax: +662-042-06582



ศูนย์บริการทดสอบและมาตรฐานอาหาร  
Food Industrial Laboratory Service Center



## Calibration Report

Certificate No.: 2502226-001-01

Equipment:

Electronic Balance

Manufacturer: METTLER TOLEDO

Model: XSR205DU

Resolution: 0.00001 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: 0.00001 g)

Nominal Value	Standard Value	Average Reading	Correction	Uncertainty	Coverage Factor
90	90.00012	90.0002	-0.0001	0.00015	2.00
100	100.00005	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	170.0002	-0.0001	0.00023	2.00
200	200.00013	200.0002	-0.0001	0.00026	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 \*\*\*\*\*

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

2000 ถนนพหลโยธิน แขวงจตุจักร เขตจตุจักร กรุงเทพฯ 10200 ประเทศไทย  
2000 3rd Fl. Anu-Armit Road, Bang Yai, Nakhon Si Thammarat, Bangkok 10200, Thailand  
Tel: +662-042-06581 Fax: +662-042-06582



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES  
3344 PATTANAKARN ROAD SOI 18, SUANLIANG, SUANLIANG BANGKOK 10250  
TEL.0-2717-3000-29 FAX.0-2719-9484



## Certificate of Calibration

Cert.No.: 25CH588

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:

20 May 2025

Calibration Date:

21 May 2025

Reference:

2505-0602WSC-3

Submitted by:

United Analyst and Engineering Consultant Co.,Ltd.  
3 Sol Udomsak 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:

Waleek Sirthean

Approved by:

Sathip

Approved Signatory

( ) Chakrit Weewwanjua

( ) Ponpan Peipim

( ) Sathip Meangmal

Issue Date:

23 May 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.: 25CH588  
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	24E2758	25 Aug 2025
2) Ref. Standard Thermometer	4982054	110RC044	24I757	14 July 2025

- 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-IRM-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
pH 4.007	CPA chem	1068685	19 Jan 2027
pH 7.000	Hach Lange GmbH	C03232	02 Dec 2026
pH 10.010	CPA chem	1068688	18 Jan 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 ( $\pm$ mV)	Coverage factor k
	pH	mV	mV	pH		
pH Meter S/N.: HA0D0082	4.00	177.48	177.3	4.01	0.058	2.00
	7.00	0.00	0.0	7.00	0.058	2.00
	7.00	0.00	0.0	7.00	0.058	2.00
	10.00	-177.48	-177.3	10.01	0.058	2.00



Cert.No.: 25CH588  
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 ( $\pm$ )	Coverage factor k
pH Electrode S/N.: Q9AA0036	4.007	4.01	180.4	0.0086	2.05
	7.000	7.00	-13.5	0.0085	2.00
	7.000	7.01	-12.6	0.0086	2.00
	10.010	10.00	-188.0	0.0092	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 ( $^{\circ}$ C)	Standard Temperature ( $^{\circ}$ C)	UUC* Reading ( $^{\circ}$ C)	Error ( $^{\circ}$ C)	Uncertainty of measurement ( $\pm$ $^{\circ}$ C)	Coverage factor k
15.0	15.002	15.0	-0.002	0.13	2.00
30.0	29.999	30.0	0.001	0.13	2.00
45.0	45.001	45.0	-0.001	0.13	2.00

Remark : - UUC\* = Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by  $\sqrt{2}$  coverage factor k, providing a level of confidence of approximately 95 %.


-060-



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.: 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, Bangkok, Phrakhanong, Bangkok 10260  
Laboratory Condition : Temperature (  $25 \pm 5$  )  $^{\circ}$ C  
Humidity (  $50 \pm 20$  ) %  
Test Procedure : In - house method : CP-CH9  
by Comparison Technique with Azide Modification Method  
Tested by : Waiialek Sirinthean  
Approved by :   
Approved Signatory  
( ) Chakrit Waeuwwanja  
( ) Ponpan Palpin  
(☒) Sathip Meengmai  
Issue Date : 18 February 2025

เอกสารไม่ควบคุม



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) (mg/L)	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

ใบผลการสอบเทียบ/ใบรับรองการสอบเทียบ (Verification of Certificate)									
Certificate No.: 25TW29		Brand : VSI		Equipment : DO Meter		Model : 5100		ID No.: UVE/MA/004/2554	
Serial No.: 1118 01865		Calibration results		DO meter		Reading		Error %	
8.22		Deviation (mg/L)		0.0055		8.22		0.0000	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000		0.0000		0.0		0.0	
0.0		0.0000							

## 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, Phra 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: Sakarin Srirahang

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 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  
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 UTAIS Lab. 14, 2022

#### 2. Reference Standards:

Reference Standard	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Standard Weight Class E2 (20VL)	1 mg to 1 kg	8749109122	AMARC	25-005359	Mettler Toledo	21 Jan-27
Standard Weight Class F1 (10VL)	1 mg to 200 g	11119512	AMARC	24-013840	Mettler Toledo	04 Feb-25
Instrument	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Thermo-Hydro-Bard Meter	MHB-3825F	AK-46457	SLKCESS	15-14-0097767	Success Gateway	21 Nov-25
Thermo-Hydro-Bard Meter	MHB-3825D	AK-46457	TPA	25P793	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 25-005359 Calibration #132

#### Calibration Results:

##### 1. Repeatability of Reading:

Nominal Value (g)	Standard Deviation of Reading (g)
200*	0.000043

##### 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)
(g)	(g)	(g)	(g)	(g)	(g)
100.0003	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 ( $\pm$ mg)	Coverage Factor k
Unloaded	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	160.000173	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

#### Remarks:

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-o

เอกสารไม่ควบคุม

## Calibration Certificate

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

Page 1 of 4

Equipment: Electronic Balance

Manufacturer: METTLER TOLEDO

Model: XSR205DU

Serial No.: C009071872

ID No.: UAE.WAO.012/2563

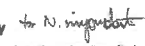
Order No.: 2502226

Operation No.: 2502226-001

Date of Receipt: 19 March 2025

Date of Calibration: 20 March 2025

Calibrated by Mr.Yothin Charoensuk  
Scientist

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

Date of Issue: 25 March 2025

The uncertainties are for a confidence probability of approximately 95%

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.

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

เอกสารไม่ควบคุม

## Calibration Report

Certificate No.: 2502226-001-01  
Equipment: Electronic Balance  
Manufacturer: METTLER TOLEDO  
Model: XSR205DU  
Resolution: 0.00001 g / 0.0001 g  
Serial No.: C09971872  
ID No.: UAE.WAO.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: 45 ± 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-NA-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 BS05567572 TCS M24041005 19 April 2025

Instrument Model Serial No. Calibrated By Certificate No. Due Date  
Thermic Hygro Meter 608-H1 NFI.BTN 017/23 Quality Pedom QP25-0542 10 February 2025

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	0.0000039
200	0.0000040

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: 20-04-55

## Calibration Report

Certificate No.: 2502226-001-01  
Equipment: Electronic Balance  
Manufacturer: METTLER TOLEDO  
Model: XSR205DU  
Resolution: 0.00001 g / 0.0001 g  
Serial No.: C09971872  
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: 0.00001 g)

Nominal Value (g)	Standard Value (g)	Average Reading (g)	Correction (g)	Uncertainty (g)	Coverage Factor
90	90.00010	90.0002	-0.0001	0.00015	2.00
100	100.00005	100.0001	-0.00005	0.00016	2.00
110	110.00007	110.0001	-0.00003	0.00017	2.00
120	120.00008	120.0002	-0.00012	0.00018	2.00
130	130.00010	130.0002	-0.0001	0.00019	2.00
140	140.00012	140.0001	-0.00002	0.00019	2.00
150	150.00009	150.0002	-0.00011	0.00021	2.00
160	160.00010	160.0002	-0.0001	0.00022	2.00
170	170.00012	170.0002	-0.00008	0.00023	2.00
200	200.00011	200.0002	-0.00009	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 %.

FCS-012 Revision: 01 Date: 20-04-55

## Calibration Report

Certificate No.: 2502226-001-01  
Equipment: Electronic Balance  
Manufacturer: METTLER TOLEDO  
Model: XSR205DU  
Resolution: 0.00001 g / 0.0001 g  
Serial No.: C09971872  
ID No.: UAE.WAO.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
Unloaded	0.00000	0.00000	0.00000	0.0000089	2.00
0.021	0.021003	0.021100	-0.000093	0.000092	2.00
0.025	0.025002	0.025050	-0.000048	0.000091	2.00
0.031	0.031007	0.031050	-0.000043	0.000091	2.00
0.05	0.049986	0.05000	0.000014	0.000098	2.00
0.1	0.100011	0.10000	0.000011	0.00011	2.00
0.5	0.500016	0.50000	0.000016	0.00014	2.00
1	1.000003	1.00001	-0.000007	0.00016	2.00
2	2.000013	2.00005	-0.000037	0.00017	2.00
5	5.000015	5.00005	-0.000035	0.00021	2.00
10	10.00005	10.00005	-0.000004	0.00025	2.00
20	20.000030	20.00012	-0.00009	0.00037	2.00
30	30.000035	30.00012	-0.000085	0.00050	2.00
50	50.000028	50.00014	-0.00011	0.00068	2.00
80	80.000067	80.00020	-0.00013	0.00011	2.00

FCS-012 Revision: 01 Date: 20-04-55

## Calibration Certificate

Certificate No.: 2502229-006-01  
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.  
Address: 3 Soi Udomsuk 41, Sukhumvit Road, Bangkok, Prakhonong, Bangkok 10260

Equipment: CHAMBER (Incubator)

Manufacturer: BINDER

Model: KB 400

Serial No.: 20200000015535

ID No.: UAE.MIC.018/2564

Order No.: 2502229

Operation No.: 2502229-006

Date of Receipt: 19 March 2025

Date of Calibration: 19 March 2025

Calibrated by Mr.Jerawut Prapawattipong Scientist

Approved by (Mr.Pheraphat Tungrit) (for) Manager, Division of Calibration Laboratory

Date of Issue: 25 March 2025

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: 20-04-55

## Calibration Report

Certificate No.: 2502229-006-01  
Equipment: CHAMBER (Incubator)  
Model: KB 400 Serial No.: 2020000015535  
Resolution: 0.1 °C ID No.: UAE.MIC.018/2564  
Manufacturer: BINDER

Date of Calibration: 19 March 2025 Page 2 of 3

Location: LABORATORY, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.  
Environment Condition:  
Ambient Temperature ( 18 ± 1 ) °C  
Relative Humidity ( 50 ± 5 ) %  
Line Voltage ( 223 ± 3 ) Volt

### Condition of this results of Calibration:

- 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	31972A	MY49016851	TE 670477-01	4 May 2025	NATIONAL FOOD INSTITUTE
	RTD	010201-305/RTD201-303			

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

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

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

6. Condition of Calibrated item : Good

### UUC Description :

Time of Record : 1 Hour 9 Minute At 35.0 °C  
Fresh air Damper : ☒ Open Position ☐ Closed  
Fan : ☒ On ☐ Off  
Not Available : ☐

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

F-05-012 Revision: 01 Date: 20-04-05

List of Instruments Certification for Water Quality Analysis

No. Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
Water pH Meter	pH	EcoSense	pH100A 204005156JEN	Technology Promotion Association (Thailand-Japan)	24CH1418	14 Nov 2024	13 Nov 25	

## Calibration Report

Certificate No.: 2502229-006-01  
Equipment: CHAMBER (Incubator)  
Model: KB 400 Serial No.: 2020000015535  
Resolution: 0.1 °C ID No.: UAE.MIC.018/2564  
Manufacturer: BINDER

Date of Calibration: 19 March 2025 Page 3 of 3

Calibration point: 35.0 °C

### Calibration result:

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

### 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	34.98	35.17	34.99	34.92	35.18	35.01	35.00	35.13	35.00	34.96	35.02	35.17	35.04	0.37

### Table 2 : Reporting of Characterisation Result

UUC <sup>1</sup> Setting (°C)	UUC <sup>1</sup> Reading (°C)			Temperature Stability ± (°C)	Temperature Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
35.0	35.0	35.0	35.0	0.029	0.15	0.30

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

UUC<sup>1</sup> = Unit Under Calibration

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

F-05-012 Revision: 01 Date: 20-04-05



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES  
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250  
TEL.0-2717-3000-29 FAX.0-2719-9464



## Certificate of Calibration

Cert.No.: 24CH1418  
Page: 1 of 3

Equipment : pH Meter  
Manufacturer : EcoSense  
Model : pH100A  
Serial No. : 24H005156JEN  
ID No. : UAE.EFM.038/2567(EFM.pH.01/67)  
Condition As-Received: Used Item  
Received Date : 13 November 2024  
Calibration Date : 14 November 2024  
Reference : 2411-0421/WSC-1  
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.  
3 Soi Udomauk 41, Sukhumvit Road,  
Bangchak, Phrakhanong, Bangkok 10260

Ambient Temperature : (25 ± 2.5) °C  
Relative Humidity : (60 ± 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 Lemgatrakul

Approved by :   
Approved Signatory

( ) Ummopphol Harachai  
( ) Ponpan Paipum  
(✓) Saithip Meangmai

Issue Date : 20 November 2024

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 & Equipment Calibration and Testing Services.

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Cert.No.: 24CH1418  
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	24E2759	25 Aug 2025
2) Ref. Standard Thermometer	4982054	110RC044	24I757	14 July 2025

- This Certification 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-1535

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.008	CPA chem	1034203	27 Sep 2025
pH 6.999	Hach Lange GmbH	C03145	28 Feb 2026
pH 10.010	CPA chem	1034205	27 Sep 2025

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	Coverage factor
	pH	mV	mV	pH	( $\pm$ mV)	k
pH Meter S/N.: 24H005156JEN	4.00	177.48	177	4.01	0.58	2.00
	7.00	0.00	0	7.00	0.58	2.00
	7.00	0.00	0	7.00	0.58	2.00
	10.00	-177.48	-177	10.01	0.58	2.00

เอกสารไม่ควบคุม



Cert.No.: 24CH1418  
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.: 240904SIA605377	4.008	4.01	175	0.0071	2.00
	6.999	7.00	0	0.0096	2.00
	6.999	7.00	0	0.0096	2.00
	10.010	10.00	-172	0.0092	2.00

Function : Temperature Measurement

(\*) Without adjustment

This equipment was connected with Temperature Probe;

- Model :  
- Serial No. : 240904SIA605377  
Dimension of probe  
- Length : 110 mm.  
- Diameter : 12 mm.  
- Immersion Depth : 100 mm

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement ( $\pm$ °C)	Coverage factor k
15.0	15.002	15.1	0.098	0.13	2.00
30.0	30.003	30.1	0.097	0.13	2.00
45.0	45.005	45.0	-0.005	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  
หนังสือขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน







เอกสารแนบท้ายหนังสือคำขอขออนุมัติขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท ยูนิเทค แอนาไลติกส์ แอนด์ เอ็นจิเนียริ่ง คอร์ปอเรชั่น จำกัด (มหาชน) เลขทะเบียน ๗-๑๔๕  
ที่ ยก ๐๓๐๐(๑) ๑๐๙๙ ลงวันที่ ๐๙ กุมภาพันธ์ ๒๕๖๕

ขอขออนุมัติห้องปฏิบัติการขึ้นทะเบียนเป็นจากกรมโรงงานอุตสาหกรรม จำนวน ๓๘๗ รายการ

น้ำได้ขึ้น จำนวน 46 รายการ

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

25 Endrin aldehyde...

ลำดับ	สารมลพิษ	วิธีวิเคราะห์
25	Endrin aldehyde	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup>
26	Formaldehyde	Distillation, Colorimetric Method <sup>(1)</sup>
27	Free Chlorine	1) Iodometric Method <sup>(1)</sup> 2) DPD Ferrous Titrimetric Method <sup>(1)</sup>
28	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup>
29	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup>
30	Hexavalent Chromium	Colorimetric Method <sup>(1)</sup>
31	Lead	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
32	Manganese	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
33	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(1)</sup>
34	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup>
35	Nickel	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
36	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method <sup>(1)</sup> 2) Soxhlet Extraction Method <sup>(1)</sup>
37	pH	Electrometric Method <sup>(1)</sup>
38	Phenol	1) Distillation, Chloroform Extraction Method <sup>(1)</sup> 2) Distillation, Direct Photometric Method <sup>(1)</sup>
39	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
40	Sulfide	1) Iodometric Method <sup>(1)</sup> 2) Methylene Blue Method <sup>(1)</sup>
41	Temperature	Laboratory and Field Methods <sup>(1)</sup>
42	Total Dissolved Solids	Dried at 180 °C <sup>(1)</sup>
43	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method <sup>(1)</sup>
44	Total Suspended Solids	Dried from 103 to 105 °C <sup>(1)</sup>
45	Trivalent Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
46	Zinc	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>

น้ำได้ขึ้น...

น้ำได้ขึ้น จำนวน 126 รายการ

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

14 Benz(a)pyrene...

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

29 Chlorobenzene...

ลำดับ	สารเคมี	วิธีวิเคราะห์
29	Chlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
30	Chlorodibromomethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
31	Chloroform	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
33	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(2)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(3)</sup>
34	Chromium (III)	1) Digestion, Direct Air-Acetylene Flame Method; Colorimetric Method; Calculation <sup>(2)</sup> 2) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation <sup>(3)</sup>
35	Chromium (VI)	Colorimetric Method <sup>(2)</sup>
36	Chrysene	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
37	Cyanide	Distillation, Colorimetric Method <sup>(1)</sup>
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup>
39	DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
40	DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
41	DDT	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
42	Dibenz(a,h)anthracene	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>

43 Di-n-butyl phthalate

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

61 2,4-Dinitrotoluene

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

74 α-HCH

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

87 Methylene chloride

ลำดับ	สารเคมี	วิธีวิเคราะห์
87	Methylene chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
89	2-Methylnaphthalene	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(6)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
90	Methyl tert-butyl ether	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
91	Naphthalene	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(6)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
92	Nickel	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
95	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB-1242 - PCB-1248 - PCB-1254 - PCB-1260	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(6)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
98	pH	Electrometric Method <sup>(4)</sup>
99	Phenanthrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(6)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>

100 Phenol...

ลำดับ	สารเคมี	วิธีวิเคราะห์
100	Phenol	1) Distillation, Chloroform Extraction Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
101	Pyrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(6)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
102	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
103	Silver	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
104	Styrene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
105	1,1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
106	Tetrachloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
107	Toluene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
108	Toxaphene	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(6)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
109	TPH (C <sub>9</sub> - C <sub>9</sub> )	1) Purge and Trap, Gas Chromatographic Method <sup>(6,20)</sup> 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(6,20)</sup>
110	TPH (C <sub>10</sub> - C <sub>10</sub> )	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(6,17)</sup>
111	TPH (C <sub>16</sub> - C <sub>16</sub> )	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(6,17)</sup>
112	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
113	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
114	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>
115	Trichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(6)</sup>

115 2,4,5-Trichlorophenol...

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

ธาตุเคมี (ป่องระเหย) จำนวน 25 รายการ

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

Chromium (6e)...

ลำดับ	สารเคมี	วิธีวิเคราะห์
6	Chromium (6e)	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
7	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
8	Copper	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
9	Cresol	Absorption Sampling, Gas Chromatographic Method <sup>(6)</sup>
10	Dioxin/Furans	Isokinetic Sampling <sup>(2)</sup>
11	Hydrogen Chloride	Isokinetic Sampling, Ion Chromatographic Method <sup>(4)</sup>
12	Hydrogen Fluoride	Isokinetic Sampling, Ion Chromatographic Method <sup>(4)</sup>
13	Hydrogen Sulfide	Absorption Sampling, Iodometric Method <sup>(4)</sup>
14	Lead	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
15	Manganese	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
16	Mercury	Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(4)</sup>
17	Nickel	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
18	Opacity	Ringelmann's Method <sup>(4)</sup>
19	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic acid Method <sup>(4)</sup> 2) Instrumental Analyzer Method <sup>(4)</sup>
20	Selenium	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(4)</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
21	Sulfur Dioxide	1) Absorption Sampling, Barium-Thionin Titrimetric Method <sup>(4)</sup> 2) Instrumental Analyzer Method <sup>(4)</sup>
22	Sulfuric Acid	Isokinetic Sampling, Barium-Thionin Titrimetric Method <sup>(4)</sup>

23 Total Suspended Particulate...

ลำดับ	สารมลพิษ	วิธีการตรวจ
23	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method <sup>(3)</sup>
24	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(2)</sup>
25	Xylene	1) Bag Sampling, Gas Chromatographic Method <sup>(3)</sup> 2) Adsorption Sampling, Gas Chromatographic Method <sup>(5)</sup>

สิ่งบ่งชี้คุณภาพอากาศที่ใช้ตัว จำนวน 35 รายการ

ลำดับ	สารมลพิษ	วิธีการตรวจ
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(3,23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(10,23)</sup>
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,4,16)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup>
3	Arsenic	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(3,4,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,4,16)</sup> 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup>
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,4,16)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup>
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,4,16)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup>
6	Cadmium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(3,4,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,4,16)</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup>
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(3,23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(10,23)</sup>

8 Chromium

ลำดับ	สารมลพิษ	วิธีการตรวจ
8	Chromium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(3,4,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,4,16)</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup>
9	Chromium (III)	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method, Waste Extraction, Colorimetric Method, Calculation <sup>(3,4,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method, Waste Extraction, Colorimetric Method, Calculation <sup>(3,4,16)</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method, Alkaline Digestion, Colorimetric Method, Calculation <sup>(3,4,16)</sup> 4) Digestion, Inductively Coupled Plasma Method, Alkaline Digestion, Colorimetric Method, Calculation <sup>(3,4,16)</sup>
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method <sup>(3,17)</sup> 2) Alkaline Digestion, Colorimetric Method <sup>(3,17)</sup>
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,4,16)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup>
12	Copper	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(3,4,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,4,16)</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup>
13	2,4-D	1) Waste Extraction, Gas Chromatographic Method <sup>(3,23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(10,23)</sup>
14	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(3,23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(10,23)</sup>

15 DDE

ลำดับ	สารมลพิษ	วิธีการตรวจ
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(3,23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(10,23)</sup>
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(3,23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(10,23)</sup>
17	Dieldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(3,23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(10,23)</sup>
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(3,23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(10,23)</sup>
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(3,23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(10,23)</sup>
20	Lead	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(3,4,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,4,16)</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup>
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(3,23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(10,23)</sup>
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(3,19)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,4,16)</sup> 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(7,19)</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup>

Mercury (Total)

ลำดับ	สารมลพิษ	วิธีการตรวจ
22	Mercury (Total)	3) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method <sup>(3,19)</sup>
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(3,23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(10,23)</sup>
24	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,4,16)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup>
25	Nickel	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(3,4,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,4,16)</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup>
26	Polychlorinated Biphenyls - Aroclor 1016 - Aroclor 1221 - 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',4,5'-Pentachlorobiphenyl	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(3,23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(10,23)</sup>



WAE  
WATTANA ENGINEERING AND ARCHITECTURE  
CONSULTANT COMPANY LIMITED

Polychlorinated Biphenyls (Total)

ลำดับ	สารเคมี	วิธีวิเคราะห์
27	Polychlorinated Biphenyls(คอป) - 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',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 <sup>(1,2,28)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup> Electrometric Method <sup>(31,32)</sup>
28	pH	
29	Selenium	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(3,3,23)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,3,14)</sup> 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(7,23)</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
30	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,3,14)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
31	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,3,14)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>

32 Toxaphene...

ลำดับ	สารเคมี	วิธีวิเคราะห์
32	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1,3,21)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(16,21)</sup>
33	Trichloroethylene	1) Waste Extraction, Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,11)</sup> 2) Waste Extraction, Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method <sup>(1,11,17)</sup> 3) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,17)</sup> 4) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method <sup>(1,17)</sup>
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,3,14)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
35	Zinc	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(3,3,15)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(3,3,14)</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1,15)</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>

ขึ้นจำนวน 125 รายการ

ลำดับ	สารเคมี	วิธีวิเคราะห์
1	Aconaphthene	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(16,26)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
2	Acetone	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,11)</sup>
3	Aldrin	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(16,26)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
4	Anthracene	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(16,26)</sup>

Anthracene (คอป)...

ลำดับ	สารเคมี	วิธีวิเคราะห์
4	Anthracene (คอป)	2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
5	Antimony	Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(7,14)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
7	Atrazine	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
8	Barium	Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
9	Benz(a)anthracene	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(16,26)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
10	Benzene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,17)</sup> 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method <sup>(1,17)</sup>
11	Benzo(b)fluoranthene	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(16,26)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
12	Benzo(k)fluoranthene	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(16,26)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
13	Benzoic acid	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
14	Benzo(a)pyrene	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(16,26)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
15	Benzo(g,h,i)perylene	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(16,26)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
15	Beryllium	Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>

17 Bis(2-chloroethyl)ether...

ลำดับ	สารเคมี	วิธีวิเคราะห์
17	Bis(2-chloroethyl)ether	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
18	Bis(2-ethoxyethyl)phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
19	Dibromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,17)</sup>
20	Bromoform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,17)</sup>
21	Butanol	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,17)</sup>
22	Butyl benzyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
23	Cadmium	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
24	Carbazole	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,17)</sup>
26	Carbon tetrachloride	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,17)</sup> 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method <sup>(1,17)</sup>
27	Chlordane	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(16,26)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
28	p-Chloroaniline	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,17)</sup>
30	Chlorodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,17)</sup>
31	Chloroform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,17)</sup>
32	2-Chlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,26)</sup>

33 Chromium...

ลำดับ	สารเคมี	วิธีการตรวจ
33	Chromium	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
34	Chromium (III)	1) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation <sup>(7.4.1.1)</sup> 2) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation <sup>(7.4.1.1)</sup>
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method <sup>(8.17)</sup>
36	Chrysene	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
37	Cyanide	Extraction, Distillation, Colorimetric Method <sup>(7.30)</sup>
38	2,4-D	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
39	DDD	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
40	DDE	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
41	DDT	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
42	Dibenz(a,h)anthracene	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
43	Di-n-butyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup>

45 1,3-Dichlorobenzene...

ลำดับ	สารเคมี	วิธีการตรวจ
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup>
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup>
47	3,3'-Dichlorobenzidine	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
48	1,1-Dichloroethane	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup> 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup>
49	1,2-Dichloroethane	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup> 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup>
50	1,1-Dichloroethylene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup> 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup>
51	cis-1,2-Dichloroethylene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup> 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup>
52	trans-1,2-Dichloroethylene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup> 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup>
53	2,4-Dichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup>
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup>
56	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup>
57	Dieldrin	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>

58 Diethyl phthalate...

ลำดับ	สารเคมี	วิธีการตรวจ
58	Diethyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
59	2,4-Dimethylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
60	2,4-Dinitrophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
61	2,4-Dinitrotoluene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
62	2,6-Dinitrotoluene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
63	Di-n-Octyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
64	Endosulfan	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
65	Endrin	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
66	Ethylbenzene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup> 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup>
67	Fluoranthene	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
68	Fluorene	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
69	Heptachlor	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
70	Heptachlor epoxide	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>

Heptachlor epoxide (80)...

ลำดับ	สารเคมี	วิธีการตรวจ
70	Heptachlor epoxide (80)	2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
71	Hexachlorobenzene	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup>
73	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11.21)</sup>
74	α-HCH	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
75	β-HCH	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
76	γ-HCH	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
77	Hexachlorocyclopentadiene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
78	Hexachloroethane	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
79	Indeno(1,2,3-cd)pyrene	1) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
80	Isophorone	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10.23)</sup>
81	Lead	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
82	Manganese	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>

83 Mercury...

Polychlorinated Biphenyls(คอป)...

97 Pentachlorophenol111 1,2,4-Trichlorobenzene...125 Zinc

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