

APPENDIX-3

เอกสาร 3-3 Certificate of Testing Laboratory Accreditation

Ref No. : 0303/17008

CERTIFICATE OF TESTING LABORATORY ACCREDITATION

This is to certify that

Laboratory of Water Analysis Center Co., Ltd.
1/94 Moo 5, Tambon Kanharm, Amphoe U-Thai,
Changwat Phra Nakhon Si Ayutthaya 13210

has successfully undergone assessment according to ISO/IEC 17025 : 2017
and under the Bureau of Laboratory Accreditation, Department of Science Service
for the requirements, regulations and criteria for the competence of testing laboratories

LABORATORY ACCREDITATION
BLA-DSS

Accreditation Number TESTING - 0029

The scope of accreditation is as annexed hereto

Issue date : *7th November 2022*
Expired date : *6th November 2026*
Signature : [redacted]

(Mrs. Pochaman Tagheen)
Director of Bureau of Laboratory Accreditation

Bureau of Laboratory Accreditation, Department of Science Service,
Ministry of Higher Education, Science, Research and Innovation

Scope of Testing Laboratory Accreditation

Laboratory Name : Laboratory of Water Analysis Center Co., Ltd.
Address : 1/94 Moo 5, Tambon Kanharm, Amphoe U-Thai,
Changwat Phra Nakhon Si Ayutthaya 13210
Accreditation Number : Testing - 0029
Laboratory Status : ☑ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1	Bottled drinking water	- Chloride 6 mg/L to 1 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Cl⁻ B
		- Total hardness (Calculated as $CaCo_3$) 5 mg/L to 2 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C
		- Total solids dried at 103 °C to 105 °C 25 mg/L to 4 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 B

Scope of Testing Laboratory Accreditation

Laboratory Name : Laboratory of Water Analysis Center Co., Ltd.

Address : 1/94 Moo 5, Tambon Kanharm, Amphoe U-Thai,
Changwat Phra Nakhon Si Ayutthaya 13210

Accreditation Number : Testing - 0029

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Bottled drinking water	- Manganese 0.05 mg/L to 5 mg/L - Iron 0.10 mg/L to 5 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 3111 B, 3030 E
		- Cadmium 1 µg/L to 5 µg/L - Lead 10 µg/L to 50 µg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 3113 B, 3030 E
		- pH 6.0 to 8.0	In - house method : TM 001 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-H^+ B

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
2	Water	- pH 6.0 to 10.0	In - house method : TM 001 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-H^+ B
		- Total suspended solids dried at 103 °C to 105 °C 10 mg/L to 1 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D
		- Total dissolved solids dried at 180 °C 25 mg/L to 4 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C

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Accreditation Number : Testing - 0029

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
2 (cont.)	Water	- Cadmium 0.02 mg/L to 0.9 mg/L - Copper 0.05 mg/L to 5 mg/L - Zinc 0.05 mg/L to 5 mg/L - Chromium 0.05 mg/L to 5 mg/L - Nickel 0.10 mg/L to 4 mg/L - Manganese 0.05 mg/L to 5 mg/L - Lead 0.10 mg/L to 2 mg/L - Iron 0.10 mg/L to 5 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 3111 B, 3030 E

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
2 (cont.)	Water	- Water soluble silica (Calculated as SiO_2) 1.1 mg/L to 26 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SiO_2 C
		- Chloride 6 mg/L to 1 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Cl^- B
		- Total hardness (Calculated as $CaCO_3$) 5 mg/L to 2 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C

Initial Issue Date 23rd September 2008 Issue Number 13

Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Higher Education, Science, Research and Innovation

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
2 (cont.)	Water	- BOD 2 mg/L to 500 mg/L	In - house method : TM 041 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B
		- BOD 2 mg/L to 500 mg/L	In - house method : TM 013 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500-O C
		- COD 40 mg/L to 200 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5220 C

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
2 (cont.)	Water	- Total Kjeldahl Nitrogen 5 mg/L to 200 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NH_3 C, part 4500-N_{org} B
		- Oil and grease 2 mg/L to 100 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 D
		- Total solids dried at 103 °C to 105 °C 25 mg/L to 4 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 B

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
2 (cont.)	Water	- Selenium 5 µg/L to 50 µg/L - Arsenic 5 µg/L to 50 µg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 3114 C
		- Barium 0.5 mg/L to 5 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 3111 D, 3030 E
		- Cadmium 1 µg/L to 5 µg/L - Lead 10 µg/L to 50 µg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 3113 B, 3030 E

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3	Wastewater	- pH 4.0 to 10.0	In - house method : TM 001 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H^+ B
		- Total suspended solids dried at 103 °C to 105 °C 10 mg/L to 1 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D
		- Total dissolved solids dried at 180 °C 50 mg/L to 4 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	- Cadmium 0.02 mg/L to 0.9 mg/L - Copper 0.05 mg/L to 5 mg/L - Zinc 0.05 mg/L to 5 mg/L - Chromium 0.05 mg/L to 5 mg/L - Nickel 0.10 mg/L to 4 mg/L - Manganese 0.05 mg/L to 5 mg/L - Lead 0.10 mg/L to 2 mg/L - Iron 0.10 mg/L to 5 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 3111 B, 3030 E

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	- Total hardness (Calculated as $CaCO_3$) 5 mg/L to 2 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2340 C
		- BOD 4 mg/L to 7 000 mg/L	In - house method : TM 041 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B
		- BOD 4 mg/L to 7 000 mg/L	In - house method : TM 013 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500-O C

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	- COD 40 mg/L to 3 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5220 C
		- Total Kjeldahl Nitrogen 5 mg/L to 200 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-NH_3 C, 4500-N_{org} B
		- Oil and grease 2 mg/L to 1 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 D

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	- Total solids dried at 103 °C to 105 °C 25 mg/L to 4 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 B
		- Selenium 5 µg/L to 50 µg/L - Arsenic 5 µg/L to 50 µg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 3114 C
		- Barium 0.5 mg/L to 5 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 3111 D, 3030 E

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
4	Environmental noise	- Sound level Equivalent sound level $L_{eq,T}$ 30 dB (A) to 120 dB (A) Maximum sound level L_{max} 30 dB (A) to 120 dB (A)	In - house method : TM 201 based on ISO 1996-2 : 2017

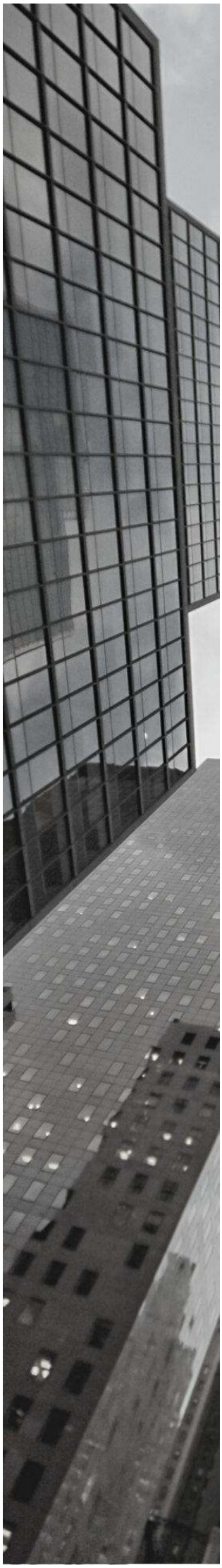
Issue Date : 7th November 2022

Signature : [redacted]

(Mrs. Pochaman Tagheen)

Director of Bureau of Laboratory Accreditation

Initial Issue Date 23rd September 2008 Issue Number 13



APPENDIX-4

ใบรายงานผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง

บริษัท ศูนย์วิเคราะห์น้ำ จำกัด
WATER ANALYSIS CENTER COMPANY LIMITED
1/94 หมู่ 5 ต. คานหาม อ. อุทัย จ. พระนครศรีอยุธยา 13210
1/94 Moo 5, T.Kanham, A.U-Thai, Ayutthaya 13210, Thailand
Tel : 035-226-383 , 035-800-593 Fax : 035-800-594

TESTING
No.0029

ANALYSIS REPORT

Customer Name :บริษัท พรีเสิร์ช จำกัด
Address :30 ซอยปุณณวิถี 24 แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร 10260
Contact :คุณเบิญจพร อินทรเพชร (แพท) **Phone** :080-102-2495 **E.mail** :b.intorpetch@gmail.com
Samply Type : Waste water **Sample Site#** : โครงการ แกรนด์ พาร์ควิว อโศก **Sampling Method#** : Grab
Sampling Date# : 31/01/2024 **Sampling By#** : Rungsasikorn (ว-190-จ-0002) **Receive Date** : 31/01/2024
Analysis Date : 31/01/2024-07/02/2024 **Report Date** : 07/02/2024 **Report No.** : R 00746/67

Parameter	Unit	Method	WC 00885/67 น้ำก่อนเข้าระบบบำบัด	WC 00886/67 น้ำทิ้งที่ผ่านการบำบัดก่อนระบายออกสู่ภายนอกโครงการ	Standard *
pH	-	In-house method: TM 001	7.4 (25°C)	7.4 (25°C)	5.0-9.0
BOD	mg/L	In-house method : TM 013	542	41	≤ 30
Total Suspended Solid	mg/L	APHA, AWWA, WEF Edition 23rd2017, part 2540 D	1680 #	75	≤ 40
Total Dissolved Solid	mg/L	Dried at 103-105 °C	493 #	448 # **	≤ 500
Settleable Solids	mL/L	Volumetric	60 #	2.0 #	≤ 0.5
Oil & Grease	mg/L	APHA, AWWA, WEF Edition 23rd2017, part 5520 D	64	6	≤ 20
Total Kjeldahl Nitrogen	mg/L as N	APHA,AWWA,WEF Edition23rd2017, part4500-NorgB,NH3 C	81	17	≤ 35
Sulfide	mg/L as S^{2-}	Iodometric	5.2 #	< 0.10 #	≤ 1.0
Total Coliform Bacteria	MPN/100 mL	Standard Total Coliform Fermentation	3.3×10^6 #	1.7×10^5 #	-
Sample Characterization		Observation	เทาขุ่นมีตะกอน	ขุ่นมีตะกอน	

Remark : In-house method : TM 013 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF23rd,2017 ,part5210B,4500-O C
In-house method : TM 001 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd 2017,part 4500-H+B
Limit of Quantitation ; LOQ (BOD=4 mg/L, SS=10 mg/L, Oil & Grease=2 mg/L, TKN=5 mg/L as N,)
It is outside the scope of ISO/IEC 17025
* อ้างอิงประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากอาคารบางประเภทและบางขนาด (อาคารประเภท ข)
** ต้องมีค่าเพิ่มขึ้นจากปริมาณสารละลายในน้ำใช้ตามปกติไม่เกิน 500 มิลลิกรัมต่อลิตร (ปริมาณสารละลายในน้ำใช้ 252 มิลลิกรัมต่อลิตร)

-: End Of Report :-

Laboratory Staff [redacted]
(Miss. Suwalee Bangsaengorn)
Chemist
ว-190-จ-0003

Approved [redacted]
(Mrs. Neeramol Phadungsong)
General Manager
ว-190-ค-0001

The results relate only to the items tested. Test report shall not be reproduced except in full, without written approval of the laboratory

บริษัท ศูนย์วิเคราะห์น้ำ จำกัด
WATER ANALYSIS CENTER COMPANY LIMITED
1/94 หมู่ 5 ต. คานหาม อ. อุทัย จ. พระนครศรีอยุธยา 13210
1/94 Moo 5, T.Kanham, A.U-Thai, Ayutthaya 13210, Thailand
Tel : 035-226-383 , 035-800-593 Fax : 035-800-594

TESTING
No.0029

ANALYSIS REPORT

Customer Name :บริษัท พรีเสิร์ช จำกัด
Address :30 ซอยปุณณวิถี 24 แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร 10260
Contact :คุณเบิญจพร อินทรเพชร (แพท) **Phone** :080-102-2495 **E.mail** :b.intorpetch@gmail.com
Samply Type : Waste water **Sample Site#** : โครงการ แกรนด์ พาร์ควิว อโศก **Sampling Method#** : Grab
Sampling Date# : 20/02/2024 **Sampling By#** : KRISSANA (ว-190-จ-0029) **Receive Date** : 21/02/2024
Analysis Date : 21-28/02/2024 **Report Date** : 28/02/2024 **Report No.** : R 01309/67

Parameter	Unit	Method	WC 01595/67 น้ำก่อนเข้าระบบบำบัด	WC 01596/67 น้ำทิ้งที่ผ่านการบำบัดก่อนระบายออกสู่ภายนอกโครงการ	Standard *
pH	-	In-house method: TM 001	7.5 (25°C)	7.1 (25°C)	5.0-9.0
BOD	mg/L	In-house method : TM 013	220	24	≤ 30
Total Suspended Solid	mg/L	APHA, AWWA, WEF Edition 23rd2017, part 2540 D	82	68	≤ 40
Total Dissolved Solid	mg/L	Dried at 103-105 °C	478 #	422 # **	≤ 500
Settleable Solids	mL/L	Volumetric	1.0 #	0.8 #	≤ 0.5
Oil & Grease	mg/L	APHA, AWWA, WEF Edition 23rd2017, part 5520 D	7	< 2	≤ 20
Total Kjeldahl Nitrogen	mg/L as N	APHA,AWWA,WEF Edition23rd2017, part4500-NorgB,NH3 C	55	8	≤ 35
Sulfide	mg/L as S^{2-}	Iodometric	2.6 #	< 0.10 #	≤ 1.0
Total Coliform Bacteria	MPN/100 mL	Standard Total Coliform Fermentation	1.6×10^7 #	2.3×10^4 #	-
Sample Characterization		Observation	ขุ่นมีตะกอน	ขุ่นมีตะกอน	

Remark : In-house method : TM 013 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF23rd,2017 ,part5210B,4500-O C
In-house method : TM 001 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd 2017,part 4500-H+B
Limit of Quantitation ; LOQ (BOD=4 mg/L, SS=10 mg/L, Oil & Grease=2 mg/L, TKN=5 mg/L as N,)
It is outside the scope of ISO/IEC 17025
* อ้างอิงประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากอาคารบางประเภทและบางขนาด (อาคารประเภท ข)
** ต้องมีค่าเพิ่มขึ้นจากปริมาณสารละลายในน้ำใช้ตามปกติไม่เกิน 500 มิลลิกรัมต่อลิตร (ปริมาณสารละลายในน้ำใช้ 236 มิลลิกรัมต่อลิตร)

-: End Of Report :-

Laboratory Staff [redacted]
(Miss. Suwalee Bangsaengorn)
Chemist
ว-190-จ-0003

Approved By [redacted]
(Mrs. Neeramol Phadungsong)
General Manager
ว-190-ค-0001

The results relate only to the items tested. Test report shall not be reproduced except in full, without written approval of the laboratory
FO.LAB 7.8.1/1 รายงานผลการทดสอบ แก้ไขครั้งที่ 0,วันที่บังคับใช้ : 1 ม.ค. 2562 หน้า 1/1

บริษัท ศูนย์วิเคราะห์น้ำ จำกัด
WATER ANALYSIS CENTER COMPANY LIMITED
1/94 หมู่ 5 ต. คานหาม อ. อุทัย จ. พระนครศรีอยุธยา 13210
1/94 Moo 5, T.Kanham, A.U-Thai, Ayutthaya 13210, Thailand
Tel : 035-220-383 , 035-800-593 Fax : 035-800-594

TESTING No.0029

ANALYSIS REPORT

Customer Name :บริษัท พรีเสิร์ช จำกัด
Address :30 ซอยปุณณวิถี 24 แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร 10260

Contact	:คุณเบ็ญจพร อินทรเพชร (แพท)	**Phone**	:080-102-2495	**E.mail**	:b.intorpetch@gmail.com
Samply Type	: Waste water	**Sample Site#**	: โครงการ แกรนด์ พาร์ควิว อโศก	**Sampling Method#**	: Grab
Sampling Date#	: 20/03/2024	**Sampling By#**	: TANAKIT (ว-190-จ-0020)	**Receive Date**	: 20/03/2024
Analysis Date	: 20-28/03/2024	**Report Date**	: 28/03/2024	**Report No.**	: R 01963/67

Parameter	Unit	Method	WC 02393/67 น้ำก่อนเข้าระบบบำบัด	WC 02394/67 น้ำทิ้งที่ผ่านการบำบัดก่อนระบายออกสู่ภายนอกโครงการ	Standard *
pH	-	In-house method: TM 001	7.4 (25°C)	7.4 (25°C)	5.0-9.0
BOD	mg/L	In-house method : TM 013	127	17	≤ 30
Total Suspended Solid	mg/L	APHA, AWWA, WEF Edition 23rd2017, part 2540 D	520	30	≤ 40
Total Dissolved Solid	mg/L	Dried at 103-105 °C	328 #	344 #**	≤ 500
Settleable Solids	mL/L	Volumetric	35 #	0.3 #	≤ 0.5
Oil & Grease	mg/L	APHA, AWWA, WEF Edition 23rd2017, part 5520 D	18	< 2	≤ 20
Total Kjeldahl Nitrogen	mg/L as N	APHA,AWWA,WEF Edition23rd2017, part4500-NorgB,NH_3 C	84	6	≤ 35
Sulfide	mg/L as S^{2-}	Iodometric	7.3 #	< 0.10 #	≤ 1.0
Total Coliform Bacteria	MPN/100 mL	Standard Total Coliform Fermentation	2.4×10^6 #	1.1×10^5 #	-
Sample Characterization		Observation	เหลืองขุ่นมีตะกอน	ขุ่นมีตะกอน	

Remark : In-house method : TM 013 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF23rd,2017 ,part5210B,4500-O C
In-house method : TM 001 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd 2017,part 4500-H+B
Limit of Quantitation ; LOQ (BOD=4 mg/L, SS=10 mg/L, Oil & Grease=2 mg/L, TKN=5 mg/L as N,)
It is outside the scope of ISO/IEC 17025
* อ้างอิงประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากอาคารบางประเภทและบางขนาด (อาคารประเภท ซ)
** ต้องมีค่าเพิ่มขึ้นจากปริมาณสารละลายในน้ำใช้ตามปกติไม่เกิน 500 มิลลิกรัมต่อลิตร (ปริมาณสารละลายในน้ำใช้ 212 มิลลิกรัมต่อลิตร)

-: End Of Report :-

Laboratory Staff [redacted]
(Miss. Orawan Sritai)
Chemist
ว-190-จ-0007

Approved By [redacted]
(Mrs. Neeramol Phadungsong)
General Manager
ว-190-ค-0001

The results relate only to the items tested. Test report shall not be reproduced except in full, without written approval of the laboratory

บริษัท ศูนย์วิเคราะห์น้ำ จำกัด
WATER ANALYSIS CENTER COMPANY LIMITED
1/94 หมู่ 5 ต. คานหาม อ. อุทัย จ. พระนครศรีอยุธยา 13210
1/94 Moo 5, T.Kanham, A.U-Thai, Ayutthaya 13210, Thailand
Tel : 035-226-383 , 035-800-593 Fax : 035-800-594

TESTING No.0029

ANALYSIS REPORT

Customer Name :บริษัท พรีเสิร์ช จำกัด
Address :30 ซอยปุณณวิถี 24 แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร 10260

Contact	:คุณเบ็ญจพร อินทรเพชร (แพท)	**Phone**	:080-102-2495	**E.mail**	:b.intorpetch@gmail.com
Samply Type	: Waste water	**Sample Site#**	: โครงการ แกรนด์ พาร์ควิว อโศก	**Sampling Method#**	: Grab
Sampling Date#	: 11/04/2024	**Sampling By#**	: TANAKIT (ว-190-จ-0020)	**Receive Date**	: 11/04/2024
Analysis Date	: 11-24/04/2024	**Report Date**	: 24/04/2024	**Report No.**	: R 02588/67

Parameter	Unit	Method	WC 03170/67 น้ำก่อนเข้าระบบบำบัด	WC 03171/67 น้ำทิ้งที่ผ่านการบำบัดก่อนระบายออกสู่ภายนอกโครงการ	Standard *
pH	-	In-house method: TM 001	7.2 (25°C)	7.2 (25°C)	5.0-9.0
BOD	mg/L	In-house method : TM 013	475	14	≤ 30
Total Suspended Solid	mg/L	APHA, AWWA, WEF Edition 23rd2017, part 2540 D	1668 #	36	≤ 40
Total Dissolved Solid	mg/L	Dried at 103-105 °C	344 #	418 #**	≤ 500
Settleable Solids	mL/L	Volumetric	60 #	0.1 #	≤ 0.5
Oil & Grease	mg/L	APHA, AWWA, WEF Edition 23rd2017, part 5520 D	26	< 2	≤ 20
Total Kjeldahl Nitrogen	mg/L as N	APHA,AWWA,WEF Edition23rd2017, part4500-NorgB,NH_3 C	138	8	≤ 35
Sulfide	mg/L as S^{2-}	Iodometric	0.77 #	< 0.10 #	≤ 1.0
Total Coliform Bacteria	MPN/100 mL	Standard Total Coliform Fermentation	3.5×10^7 #	3.3×10^4 #	-
Sample Characterization		Observation	ตำขุ่นมีตะกอน	ขุ่นมีตะกอน	

Remark : In-house method : TM 013 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF23rd,2017 ,part5210B,4500-O C
In-house method : TM 001 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd 2017,part 4500-H+B
Limit of Quantitation ; LOQ (BOD=4 mg/L, SS=10 mg/L, Oil & Grease=2 mg/L, TKN=5 mg/L as N,)
It is outside the scope of ISO/IEC 17025
* อ้างอิงประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากอาคารบางประเภทและบางขนาด (อาคารประเภท ซ)
** ต้องมีค่าเพิ่มขึ้นจากปริมาณสารละลายในน้ำใช้ตามปกติไม่เกิน 500 มิลลิกรัมต่อลิตร (ปริมาณสารละลายในน้ำใช้ 162 มิลลิกรัมต่อลิตร)

-: End Of Report :-

Laboratory Staff [redacted]
(Miss. Ronnakorn Padungwieng)
Chemist
ว-190-จ-0010

Approved By [redacted]
(Mrs. Neeramol Phadungsong)
General Manager
ว-190-ค-0001

The results relate only to the items tested. Test report shall not be reproduced except in full, without written approval of the laboratory

บริษัท ศูนย์วิเคราะห์น้ำ จำกัด
WATER ANALYSIS CENTER COMPANY LIMITED
1/94 หมู่ 5 ต. คานหาม อ. อุทัย จ. พระนครศรีอยุธยา 13210
1/94 Moo 5, T.Kanham, A.U-Thai, Ayutthaya 13210, Thailand
Tel : 035-226-383 , 035-800-593 Fax : 035-800-594

TESTING
No.0029

ANALYSIS REPORT

Customer Name :บริษัท พรีเสิร์ช จำกัด
Address :30 ซอยปุณณวิถี 24 แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร 10260
Contact :คุณเบ็ญจพร อินทรเพชร (แพท) **Phone** :080-102-2495 **E.mail** :b.intorpetch@gmail.com
Samply Type : Waste water **Sample Site#** : โครงการ แกรนด์ พาร์ควิว อโศก **Sampling Method#** : Grab
Sampling Date# : 10/05/2024 **Sampling By#** : MANOP (ว-190-จ-0011) **Receive Date** : 10/05/2024
Analysis Date : 10-17/05/2024 **Report Date** : 17/05/2024 **Report No.** : R 03279/67

Parameter	Unit	Method	WC 04039/67 น้ำก่อนเข้าระบบบำบัด	WC 04040/67 น้ำทิ้งที่ผ่านการบำบัดก่อนระบายออกสู่ภายนอกโครงการ	Standard *
pH	-	In-house method: TM 001	7.1 (25°C)	7.0 (25°C)	5.0-9.0
BOD	mg/L	In-house method: TM 041	300	19	≤ 30
Total Suspended Solid	mg/L	APHA, AWWA, WEF Edition 23rd 2017, part 2540 D	475	26	≤ 40
Total Dissolved Solid	mg/L	Dried at 103-105 °C	390 #	442 # **	≤ 500
Settleable Solids	mL/L	Volumetric	15 #	0.4 #	≤ 0.5
Oil & Grease	mg/L	APHA, AWWA, WEF Edition 23rd 2017, part 5520 D	16	< 2	≤ 20
Total Kjeldahl Nitrogen	mg/L as N	APHA,AWWA,WEF Edition23rd 2017, part4500-NorgB,NH_3 C	71	11	≤ 35
Sulfide	mg/L as S^{2-}	Iodometric	6.0 #	< 0.10 #	≤ 1.0
Total Coliform Bacteria	MPN/100 mL	Standard Total Coliform Fermentation	1.7 x 10^7 #	7.9 x 10^4 #	-
Sample Characterization		Observation	ตำขุ่นมีตะกอน	ขุ่นมีตะกอน	

Remark : In-house method : TM 001 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd 2017,part 4500-H+B
In-house method : TM 041 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd 2017, part 4500-OG, 5210 B
Limit of Quantitation ; LOQ (BOD=4 mg/L, SS=10 mg/L, Oil & Grease=2 mg/L, TKN=5 mg/L as N,)
It is outside the scope of ISO/IEC 17025
* ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากอาคารบางประเภทและบางขนาด (อาคารประเภท ข)(พ.ศ. 2565 เรื่องเพิ่มเติมวิธีการตรวจสอบค่าบีโอดี)
** ต้องมีค่าเพิ่มขึ้นจากปริมาณสารละลายในน้ำใช้ตามปกติไม่เกิน 500 มิลลิกรัมต่อลิตร (ปริมาณสารละลายในน้ำใช้ 268 มิลลิกรัมต่อลิตร)

-: End Of Report :-

Laboratory Staff [redacted]
(Miss. Waraporn Wanwiset)
Chemist
ว-190-จ-0004

Approved [redacted]
(Mrs. Neeramol Phadungsong)
General Manager
ว-190-ค-0001

The results relate only to the items tested. Test report shall not be reproduced except in full, without written approval of the laboratory.

บริษัท ศูนย์วิเคราะห์น้ำ จำกัด
WATER ANALYSIS CENTER COMPANY LIMITED
1/94 หมู่ 5 ต. คานหาม อ. อุทัย จ. พระนครศรีอยุธยา 13210
1/94 Moo 5, T.Kanham, A.U-Thai, Ayutthaya 13210, Thailand
Tel : 035-226-383 , 035-800-593 Fax : 035-800-594

TESTING
No.0029

ANALYSIS REPORT

Customer Name :บริษัท พรีเสิร์ช จำกัด
Address :30 ซอยปุณณวิถี 24 แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร 10260
Contact :คุณเบ็ญจพร อินทรเพชร (แพท) **Phone** :080-102-2495 **E.mail** :b.intorpetch@gmail.com
Samply Type : Waste water **Sample Site#** : โครงการ แกรนด์ พาร์ควิว อโศก **Sampling Method#** : Grab
Sampling Date# : 18/06/2024 **Sampling By#** : MANOP (ว-190-จ-0011) **Receive Date** : 18/06/2024
Analysis Date : 18-27/06/2024 **Report Date** : 27/06/2024 **Report No.** : R 04179/67

Parameter	Unit	Method	WC 05195/67 น้ำก่อนเข้าระบบบำบัด	WC 05196/67 น้ำทิ้งที่ผ่านการบำบัดก่อนระบายออกสู่ภายนอกโครงการ	Standard *
pH	-	In-house method: TM 001	7.3 (25°C)	7.2 (25°C)	5.0-9.0
BOD	mg/L	In-house method: TM 041	436	19	≤ 30
Total Suspended Solid	mg/L	APHA, AWWA, WEF Edition 23rd 2017, part 2540 D	2222 #	32	≤ 40
Total Dissolved Solid	mg/L	Dried at 103-105 °C	392 #	408 # **	≤ 500
Settleable Solids	mL/L	Volumetric	74 #	0.1 #	≤ 0.5
Oil & Grease	mg/L	APHA, AWWA, WEF Edition 23rd 2017, part 5520 D	31	< 2	≤ 20
Total Kjeldahl Nitrogen	mg/L as N	APHA,AWWA,WEF Edition23rd 2017, part4500-NorgB,NH_3 C	230 #	11	≤ 35
Sulfide	mg/L as S^{2-}	Iodometric	< 0.10 #	< 0.10 #	≤ 1.0
Total Coliform Bacteria	MPN/100 mL	Standard Total Coliform Fermentation	5.4 x 10^7 #	9.2 x 10^6 #	-
Sample Characterization		Observation	ตำขุ่นมีตะกอน	ขุ่นมีตะกอน	

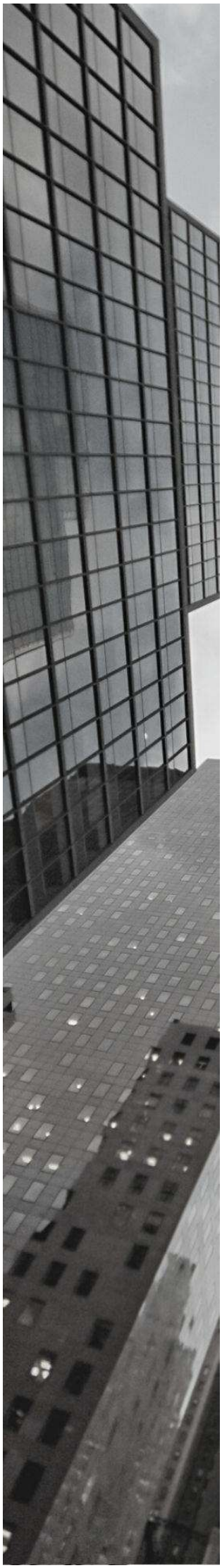
Remark : In-house method : TM 001 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd 2017,part 4500-H+B
In-house method : TM 041 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd 2017, part 4500-OG, 5210 B
Limit of Quantitation ; LOQ (BOD=4 mg/L, SS=10 mg/L, Oil & Grease=2 mg/L, TKN=5 mg/L as N,)
It is outside the scope of ISO/IEC 17025
* ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากอาคารบางประเภทและบางขนาด (อาคารประเภท ข)(พ.ศ. 2565 เรื่องเพิ่มเติมวิธีการตรวจสอบค่าบีโอดี)
** ต้องมีค่าเพิ่มขึ้นจากปริมาณสารละลายในน้ำใช้ตามปกติไม่เกิน 500 มิลลิกรัมต่อลิตร (ปริมาณสารละลายในน้ำใช้ 216 มิลลิกรัมต่อลิตร)

-: End Of Report :-

Laboratory Staff [redacted]
(Miss. Khaetthariya Mekaeo)
Chemist
ว-190-จ-0013

Approved [redacted]
(Mrs. Neeramol Phadungsong)
General Manager
ว-190-ค-0001

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APPENDIX-5

เอกสารสอบเทียบเครื่องมือการตรวจวิเคราะห์คุณภาพน้ำทิ้ง

THC Calibration Services
THAI HEART CALIBRATION CO., LTD.
112/1 Moo 5 Pinrack Sa Muang Samut Prakan 10280
Tel. 0-2824-2162, 0-2757-8455, 0-2757-8496 Fax. 0-2757-8507

ilac-MRA ANAB ACCREDITED ISO/IEC 17025 CALIBRATION LABORATORY AC-2695

CERTIFICATE OF CALIBRATION

Certificate No.: C0-1808005/23 **Page** 1 **of total** 4 **pages**

Customer WATER ANALYSIS CENTER CO., LTD.
1/94 Moo 5, T.Kanham,
A.U-thai, Ayutthaya 13210

Equipment pH Meter
Manufacturer METTLER TOLEDO **Model** SevenCompact S220
Serial No. B327527211 **ID No.** WWL 0068
Description Range : 0 - 14 pH, Resolution : 0.01 pH

Environmental Conditions Ambient Temperature: (20 ± 2) °C
Relative Humidity: (50 ± 10) %
Atmospheric Pressure: -
Calibration Location Jayhawks Laboratory (CL&GL)
Received Date 18 August 2023
Calibration Date 18 August 2023
Date of Issue 21 August 2023
Condition of Artifacts Used conditions but can be calibrated

Checked by [redacted] **Approved by** [redacted]

Act as Technical Manager — Representative of Managing Director

(Dr. Ekachai Puttitwong)

( ) (Krisyosl K.) ( ) (Sakda Y.)
( ) (Patiphan K.) (✓) (Onnapa P.)
( ) (Pongsak H.) ( ) (Nitiphong K.)
( ) (Kanung C.) ( ) (Nonthachai K.)
( ) (Pramong P.) ( ) (Noppol P.)

This calibration certificate shall not be reproduced other than in full except with the prior written approval of the Thai Heart Calibration Co., Ltd.

THC Calibration Services
THAI HEART CALIBRATION CO., LTD.
112/1 Moo 5 Pinrack Sa Muang Samut Prakan 10280
Tel. 0-2824-2162, 0-2757-8455, 0-2757-8496 Fax. 0-2757-8507
ilac-MRA ANAB ACCREDITED ISO/IEC 17025 CALIBRATION LABORATORY AC-2695

Reference Method:
- The calibration method used was CP-178 based on an in-house method.
- This certificate can be traceable to the national standards, which is realized the shown measurement units according to the International System of Units (SI Units).

Reference Standard:

Type	pH Value	Lot No.	Due Date	Traceability
pH Standard Solution	4.01	030822	Feb. 9, 2024	NIMT
	7.01	300522	Feb. 9, 2024	
	10.01	230822	Feb. 7, 2024	

Type	Model	Serial No.	Certificate No.	Due Date	Traceability
Documenting Process Calibrator	754	2630521	I0-2412001/22	Dec. 23, 2023	THC
Digital Thermometer with Sensor	1523 / 5622	1709138 / 4605984-005	I0-0806001/23	Jun. 8, 2024	

Remark: This certificate is traceable to the International System of Unit (SI Unit) through:
- NIMT, National Institute of Metrology (Thailand).
- THC, Thai Heart Calibration Co., Ltd.

Measurement Results:

1. Function Simulated pH Meter

Standard Applied	Nominal Value	UUC Reading		Uncertainty
(mV)	(pH)	pH	mV	(± mV)
177.48	4.00	4.01	177.4	0.060
0.00	7.00	7.00	0.0	0.060
-177.48	10.00	10.01	-177.4	0.060

UUC : Unit Under Calibration
Note : Adjust Curve to simulate pH (4,7,10)

Calibrated by Kittipong

Certificate No.: C0-1808005/23 **Page** 3 **of total** 4 **pages**

Measurement Results (Cont.):

2. Calibration of pH Electrode (Serial No.: 3222623)

pH Standard Solution	Measured Value		Uncertainty
(pH)	(pH)	(mV)	(± pH)
4.01	4.01	180.0	0.013
7.01	7.00	4.0	0.013
10.01	10.01	-172.0	0.013

Note : Adjust Curve to Buffer Solution pH (4,7,10)
Temperature stability of micro bath : 25 ± 0.2°C

The above reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor $k = 2.00$, providing a level of confidence approximately 95%.

Calibrated by Kittipong

THC Calibration Services
THAI HEART CALIBRATION CO., LTD.
112/1 Moo 5, Phraek Sa, Muang, Samut Prakan 10280
Tel. 0-2394-2162, 0-2757-8435, 0-2757-8496 Fax. 0-2757-8507
ilac-MRA ANAB ACCREDITED ISO/IEC 17025 CALIBRATION LABORATORY AC-2695

Certificate No.: C0-1808005/23 **Page** 4 **of total** 4 **pages**

Reference Method:

- The calibration method used was CP-096 based on an in-house method.
- The temperature scale used was an ITS-90.
- This certificate can be traceable to the national standards, which is realized the shown measurement units according to the International System of Units (SI Units).

Reference Standard Instruments:

Type	Model	Serial No.	Cert. No.	Due Date	Traceability
Thermometer Readout	1529-R	B7C853	I0-0911001/22	Nov. 9, 2023	THC
Platinum Resistance Thermometer	5626	4854	C0A30047	Oct. 22, 2023	FLUKE
Liquid Bath	XORTS-40A	XO111019	I0-2405001/23	May 25, 2025	THC

Remark: This certificate is traceable to the International System of Unit (SI Unit) through:

- THC, Thai Heart Calibration Co., Ltd.
- FLUKE, Fluke Comporation, U.S.A.

Measurement Results: (X) Without Adjustment

Dimension of probe : Diameter 4 mm. Sensor Type : RTD (PT100)

Immersion Depth (mm.)	Standard Reading (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (± °C)
120	22.00	22.2	-0.20	0.065
120	25.00	25.2	-0.20	0.065
120	28.00	28.2	-0.20	0.065

UUC : Unit Under Calibration

The above reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor $k = 2.00$, providing a level of confidence approximately 95%.

- End of Certificate -

[redacted]

Calibrated by Pongsak

MCAL
MASTER CALIBRATION CO.,LTD.

Master Calibration Co.,Ltd.
547 Soi Ratchadanivat, Kwaeng Samsennok, Khet Huaykwang, Bangkok 10310
Tel. : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989
Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

Certificate of Calibration

TEMPERATURE
CONTROLLER ENCLOSURES

NSC-TISI-TIS 17025
CALIBRATION 0183

Certificate No.: MC 2307702

Customer	:	Water Analysis Center Co., Ltd. 1/94 Moo 5, T.Kantham, A.U-Thai, Ayutthaya 13210.		
Reference Job No.	:	23-1577	Received Date	: 11 July 2023
Description	:	Refrigerator		
Manufacturer	:	SANDEN INTERCOOL	Model	: SEC-1500SBD
Serial No.	:	SEC1500201A-0708-00304	ID. No.	: WWL0038
Marking	:	Additionally for the purpose of identification by this laboratory a label marked with this certificate number (MC 2307702) has been attached to the case.		
Method	:	In-House calibration procedure MWI-T-033 this method is reference to TLAS G-20 "Temperature Controlled Enclosures".		
Location of Calibration	:	Water Analysis Center Co., Ltd. ; Laboratory.		
Environmental Conditions	:	Ambient Temperature : (25.3 to 25.9) °C Relative Humidity : (65.2 to 67.9) %		
Date of Calibration	:	11 July 2023	Date of Issue	: 12 July 2023

Checked by : [redacted]
Thanagorn Limchaicharoen
(Calibration Supervisor)

Approved by : [redacted]
Aittipong Kanjanawasit
(Technical Manager)

The uncertainties are for a confidence probability of approximately 95%

This certificate is issued in accordance with the conditions of accreditation granted by the National Standardization Council of Thailand-Office of the National Standardization Council that 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 Master Calibration Co.,Ltd.

MCAL
MASTER CALIBRATION CO.,LTD.

547 Soi Ratchadanivat, Kwaeng Samsennok, Khet Huaykwang, Bangkok 10310
Tel. : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989
Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

The Reference Standard Instrument :

Description	Certificate No.	Serial No.	Due date	Traceable thru
Data Acquisition/Switch Unit	MC 2303173	MY41010916	9 Mar 2024	MCAL
With Thermocouple Type " T " ID. No.17/1 to 17/9				

Traceability :

The measurement standard traceable to the international system of units (SI) through certificate as mentioned above

1. Calibration Procedure:

This Instrument was calibration according to TLAS G-20 by comparison with calibrated thermocouple type T under no load condition. The Thermocouples were placed on nine points and located one thermocouple in each of the eigh corners of the chamber and was away from the each wall of 5 cm to 10 cm. And placed the ninth thermocouple within 2.5 cm of the geometric center of the chamber.

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. The reference sensor should preferably be located at the geometric center of the chamber.

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

Overall Variation - The Difference of the maximum and minmum measured temperatures throughout observation.

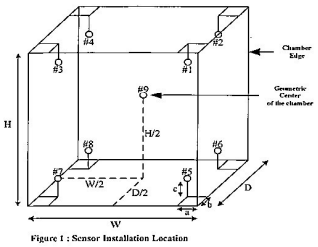


Figure 1 : Sensor Installation Location

Overall Ambient Temperature around the Chamber veriation : 3.2 °C
Overall Line Voltage variation : 0.1 V
Chamber Size (W*H*D) : 171 cm x 157 cm x 60 cm

Checked by [redacted]

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MASTER CALIBRATION CO.,LTD.

547 Soi Ratchadanivat, Kwaeng Samsennok, Khet Huaykwang, Bangkok 10310
Tel. : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989
Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

2. Result of calibration :

Temperature Measurement Accuracy Test

Indicating Temperature (°C)	Measured Temperature (°C) at Spread Locations									Uncertainty (±°C)
	#1	#2	#3	#4	#5	#6	#7	#8	Ref. #9	
2.5	4.4	4.2	4.2	4.2	4.0	3.9	4.1	4.0	3.8	0.86

Chamber Characterization Result

Controller Temperature (°C)	Indicating Temperature (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
2.0	2.5	1.50	1.01	3.3

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

This certificate will certify of the calibrated equipment only.

End of Certificate

Checked by : [redacted]

THC Calibration Services
THAI HEART CALIBRATION CO., LTD.
112/1 Moo 5, Phraek Sa, Muang, Samut Prakan 10280
Tel. 0-2394-2162, 0-2757-3435, 0-2757-3496, Fax. 0-2757-3507

ilac-MRA ANAB ACCREDITED ISO/IEC 17025 CALIBRATION LABORATORY AC-2695

CERTIFICATE OF CALIBRATION

Certificate No.: C0-1907007/23 **Page** 1 **of total** 2 **pages**

Customer WATER ANALYSIS CENTER CO., LTD.
1/94 Moo 5, T.Kanham,
A.U-thai, Ayutthaya 13210

Equipment Conductivity Meter
Manufacturer EUTECH **Model** CON 2700
Serial No. 2657889 **ID No.** WWL 0136
Description -

Environmental Conditions Ambient Temperature: (20 ± 2) °C
Relative Humidity: (50 ± 10) %
Atmospheric Pressure: -
Calibration Location Jayhawks Laboratory (CL&GL)
Received Date 19 July 2023
Calibration Date 19 July 2023
Date of Issue 20 July 2023
Condition of Artifacts Used conditions but can be calibrated

Checked by [redacted] **Approved** [redacted]

Act as Technical Manager — Representative of Managing Director

( ) (Krisyosl K.) ( ) (Sakda Y.) (Dr. Ekachai Puttitwong)
( ) (Patiphan K.) (✓) (Onnapa P.)
( ) (Pongsak H.) ( ) (Nitiphong K.)
( ) (Kanung C.) ( ) (Nonthachai K.)
( ) (Pramong P.) ( ) (Noppol P.)

This calibration certificate shall not be reproduced other than in full except with the prior written approval of the Thai Heart Calibration Co., Ltd.

THC Calibration Services
THAI HEART CALIBRATION CO., LTD.
112/1 Moo 5, Bhuak Sai, Mueang, Samut Prakan 10280
Tel. 0-2394-2162, 0-2757-3456, 0-2757-3457, Fax. 0-2757-3507

ilac-MRA ANAB ACCREDITED ISO/IEC 17025 CALIBRATION LABORATORY AC-2695

Reference Method:

- The calibration method used was CP-177 based on an in-house method.
- This certificate can be traceable to the national standards, which is realized the shown measurement units according to the International System of Units (SI Units).

Reference Standard :

Meterial	Batch Value	Lot Number	Due Date	Traceability
Conductivity Standard Solution	147.8 µS/cm	S220611005	Dec. 6, 2023	SCP Science
	1.425 mS/cm	S220812006	May 31, 2024	

Remark: This certificate is traceable to the International System of Unit (SI Unit) through:
- SCP Science.

Measurement Results: (Probe Serial No. : 93X219065)

Conductivity Standard Solution	Measured Value	Correction	Uncertainty (±)
147.8 µS/cm	147.5 µS/cm	0.3 µS/cm	2.5 µS/cm
1.425 mS/cm	1.427 mS/cm	-0.002 mS/cm	0.0051 mS/cm

Note : Adjustment points: 147.8µS/cm 1.425mS/cm

The above reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor $k = 2.00$, providing a level of confidence approximately 95%.

- End of Certificate -

Calibrated by Onnapa

AUTOMATION SERVICE CO.,LTD.
CALIBRATION LABORATORY

Automation

SV 201005/2024 **Cert. No. WAC-065**
Page 1 of 2

CERTIFICATE OF CALIBRATION

Instrument : DO Meter **Machine :** -
Model : DO-31P **Location :** -
Serial No. : 780065
Manufacturer : TOA-DKK
Measuring Range : 0.00 ~ 20.00 mg/l

Customer : Water Analysis Center Co.,Ltd.
1/94 Moo.5 T.Kanham, A.U-Thai
Ayutthaya 13210 Thailand

Date Of Received : 11 / 01 / 2024
Date Of Calibration : 11 / 01 / 2024

Ambient Condition : Temperature 26 °C
Humidity 58 % RH

Calibrated By : [redacted]
(Ms. Phanee Yooyen)
Technician

Approved By : [redacted]
(Mr. Nipon Phungsomsak)
Technical Manager

Date Of Issue : 15 / 01 / 2024

This Certificate may not be reproduced other than in full, except with the prior written approval of the head of the industrial instruments calibration center.

Automation Service Co.,Ltd. 929,929/1 Soi Pattanakarn30, Pattanakarn Rd., Suanluang, Suanluang, Bangkok 10250
Tel. : 02-319-9994 ext. 721,725 I E-mail : iso@automation.co.th, serviceia@automation.co.th I www.automation.co.th

AUTOMATION SERVICE CO.,LTD.
CALIBRATION LABORATORY

Instrument : DO Meter
Model : DO-31P
Serial No. : 780065

Cert. No. WAC-065
Page 2 of 2

Calibrate Procedure
☐ This instrument was calibrated by comparison with standard solution (PH/ORP)
☐ This instrument was calibrated by comparison with scattering plate value (Turbidity)
☐ This instrument was calibrated by comparison with conductivity (Conductivity)
☑ This instrument was calibrated by comparison with Sodium sulfite anhydrous (DO)

Condition of this result of calibration
1). Reference Standard Solution

Standard	Lot No	Batch.	Cert. No.	Due Date
Sodium Sulfite Power	408K1405	-	-	-

2). Traceability This certification is traceable to
☑ Kanto Chemical Co.,INC.
☐ DKK Corporation

Result Of Calibration

Standard Solution (mg/l) at 25.7°C		Before Adjust		After Adjust	
		Indicator	Error	Indicator	Error
Zero	0.00	0.10	+ 0.10	0.00	-
Span	8.02	6.45	- 1.57	8.02	-

DO Electrode No. OE270AA(5) S/N 111F0029

Calibrated By [redacted]
(Ms. Phanee Yooyen)
Technician

Inctech Metrological Center Co.Ltd.
39/1 Soi 82, Sukhapiban 5 Rd., O ngoen,
Saimai, Bangkok 10220, Thailand
Tel. (662) 909-8820 (Auto 10 lines) www.imcinstrument.com

ilac-MRA ACCREDITED
Calibration Cert. # 3884.01
ISO/IEC 17025

Certificate of Calibration

Certificate No. : MT24-3208
Page : 1 of 2

Customer	:	Water Analysis Center Co.,Ltd.			
Address	:	1/94 M.5, Rojana Industrial Park, T.Kanham, A.U-Thai, Ayutthaya 13210			
Description	:	Hot Air Oven	Order No.	:	1152/24
Manufacturer	:	Memmert	Received date	:	Mar 22, 2024
Model	:	UF 260	Calibration date	:	Mar 22, 2024
Serial No.	:	B620.0814	Environment Condition :		
Identification No.	:	WWL 0212	Temperature	:	(25+/-10) °C
Calibration Place	:	Customer Laboratory	Humidity	:	(50+/-30) %RH

Calibration Method : Calibration were conducted using In-house calibration procedure *CP-MT-006* According to comparison with LXI Data Acquisition Switch Unit with sensor. The calibration methods based on Euramet Calibration Guide No.20 - guidelines on the Calibration of Temperature and/or Humidity Controlled Enclosures.

Reference Standard Instruments :

Instrument	Model	Serial No.	Certificate No.	Due Date
LXI Data Acquisition Switch Unit with Sensor	34972A	MY49020096	MT23-7163	Nov 30, 2024

The effect that the result relate only to the items calibrated. It was found accurate as shown on date and place of calibration only.

Traceability : This measurement are traceable to the International System of Unit (SI), through National Institute of Metrology Thailand (NIMT)

The reported expanded uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k = 2, providing a level of confidence of not less than 95%

Calibrated by : Mr.Yuttakorn Jamneansri

Approve [redacted]

Issue date : Apr 10, 2024

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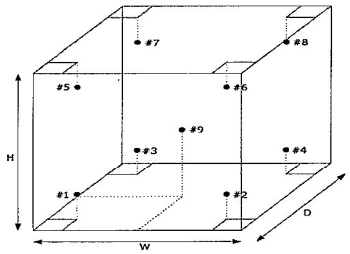
Inctech Metrological Center Co.Ltd.
39/1 Soi 82, Sukhapiban 5 Rd., O ngoen,
Saimai, Bangkok 10220, Thailand
Tel. (662) 909-8820 (Auto 10 lines) www.imcinstrument.com

ilac-MRA ACCREDITED
Calibration Cert. # 3884.01
ISO/IEC 17025

Function : Temperature measurement
Calibration point : 104, 180 °C
Result : Without adjustment
Resolution : 0.1 °C

Calibration point	Temperature of UUC* at each position (°C)									Uncertainty of measurement
(°C)	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	Ch.6	Ch.7	Ch.8	Ch.9	(+/- °C)
104	103.494	103.933	103.871	103.988	103.990	104.081	103.843	104.217	104.022	0.45
180	179.985	179.953	180.047	179.985	179.908	180.088	180.065	180.273	180.105	0.54

Setting temperature (°C)	Indicating Temperature (°C)	Measured stability (+/- °C)	Measured uniformity (°C)	Overall variation (°C)
104.0	104.0	0.34	0.66	1.3
180.0	180.0	0.41	0.86	1.2



Front view

#1 Lower Left Front
#2 Lower Right Front
#3 Lower Left Rear
#4 Lower Right Rear
#5 Upper Left Front
#6 Upper Right Front
#7 Upper Left Rear
#8 Upper Right Rear
#9 Geometric Center

UUC* = Unit under calibration
Uniformity = Maximum and Minimum difference of measured temperature at any probes and the measured temperature at the reference and same time.
Overall Variation = Difference of temperature value between the maximum and minimum any time.
Stability = One half of the maximum difference of measured temperatures at any one probe.

-oOo-

DKSH

ilac-MRA NSC-TISI-TIS 17025 Calibration 0087

Certificate of Calibration

Equipment:	Balance	Certificate No.:	C01241754
Model:	BL 210S	Issued Date:	05 June 2024
Serial No. (or ID.):	15808131 (WWL 0022)	Job No.:	WO-00030302
Manufacturer:	Sartorius	Page:	1 of 2
Condition:	In condition		

Customer: Water Analysis Center Co., Ltd.
1/94 Moo 5, Rojana Industrial Park, Rojana Road,
Tambol Kanham, Amphur U-Thai, Ayutthaya 13210 Thailand

Environment Condition: Temperature 26 °C ± 0.2 °C
Humidity 50 %RH ± 2.6 %RH

Calibration Place: Water Analysis Center Co., Ltd. (ห้องเครื่องชั่ง)
1/94 Moo 5, Rojana Industrial Park, Rojana Road,
Tambol Kanham, Amphur U-Thai, Ayutthaya 13210 Thailand

Calibration By: Mr. Polawad Ruamlrup
Calibration Date: 05 June 2024
The Method used: In-house method, CAL-WI-47, based on UKAS Lab 14
Traceability: This certificate is traceable to the SI Units maintained by National Institute of Metrology (NIMT), Thailand through DKSH Technology Co., Ltd. Certificate No. C02240400

(Mr. Polawad Ruamlrup)
Person in charge

(Mr. Rungrod Jenkittrakulchai)
Authorized signatory

This certificate is issued the units of measurement according to the International System of Units (SI). It provides traceability of measurement to international or national standard or other recognized national standard laboratories.
The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM).
These results may be affected by deviations from specified conditions. The results relate only to the items tested, calibrated or sampled. The report shall not be reproduced except in full without approval of DKSH Technology Limited.

บริษัท ดีเคเอสเอช เทคโนโลยี จำกัด
DKSH Technology Limited
2533 ถนนสุขุมวิท แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร 10260
2533 Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260
Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/scientific-thailand

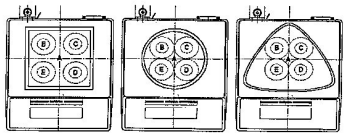
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DKSH

Calibration Results:

Without Adjustment

Eccentric Error: Weight to be 1/3 or 1/2 of Maximum capacity, taken from the center of the pan as a zero reference.



Nominal Test Value 100 (g)

Reference Points (g)				
A	B	C	D	E
-	0.0000	0.0001	0.0000	-0.0002

Repeatability: Determination of the standard deviation of weighing balance., Readability 0.0001 (g)

Nominal test value (g)	Standard Deviation
20	0.00004
200	0.00006

Error of indication from nominal or conventional mass value., Readability 0.0001 (g)

Nominal Value (g)	Conventional Mass (g)	Displayed Value (g)	Error of indication (g)	Uncertainty (g)	k
1	1.00001	1.0000	0.0000	0.00011	2.04
2	2.00002	2.0000	0.0000	0.00011	2.04
5	5.00002	5.0000	0.0000	0.00011	2.04
10	10.00001	10.0000	0.0000	0.00011	2.04
20	20.00001	20.0000	0.0000	0.00012	2.03
50	50.00003	50.0000	0.0000	0.00013	2.02
70	70.00004	70.0000	0.0000	0.00016	2.01
100	99.99996	100.0001	0.0001	0.00017	2.01
120	119.99997	120.0002	0.0002	0.00021	2.00
150	149.99999	150.0002	0.0002	0.00024	2.00
200	199.99996	200.0004	0.0004	0.00030	2.00

The End of Certificate

บริษัท ดีเคเอสเอช เทคโนโลยี จำกัด
DKSH Technology Limited
2533 ถนนสุขุมวิท แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร 10260
2533 Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260
Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/scientific-thailand

MCAL MASTER CALIBRATION CO.,LTD.

Master Calibration Co.,Ltd.
547 Soi Ratchadanivat, Kwaeng Samsennok, Khet Huaykwang, Bangkok 10310
Tel. : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989
Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

Certificate of Calibration

ilac-MRA NSC-TISI-TIS 17025 CALIBRATION 0183

LIQUID BATH

Certificate No.: MC 2314268

Customer : Water Analysis Center Co., Ltd.
1/94 Moo 5, T.Kantham, A.U-Thai, Ayutthaya 13210.

Reference Job No. : 23-2833 Received Date : 15 December 2023
Description : Water Bath
Manufacturer : ESSTELL Model : EWB-122D
Serial No. : 20180508122 ID. No. : WWL 0214
Marking : Additionally for the purpose of identification by this laboratory a label marked with this certificate number (MC 2314268) has been attached to the case.
Method : In-House calibration procedure MWI-T-029 this method is reference to ASTM E715 "Liquid Bath".
Location of Calibration : Water Analysis Center Co., Ltd. ; Laboratory.
Environmental Condition : Ambient Temperature : (29.4 to 29.8) °C
Relative Humidity : (49.0 to 52.0) %
Date of Calibration : 15 December 2023 Date of Issue : 19 December 2023

Checked by : [redacted]
Chalermkit Rakphada
(Calibration Engineer)

Approved by : [redacted]
Aittipong Kanjanawasit
(Technical Manager)

The uncertainties are for a confidence probability of approximately 95%

This certificate is issued in accordance with the conditions of accreditation granted by the National Standardization Council of Thailand-Office of the National Standardization Council that 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 Master Calibration Co.,Ltd.

MCAL
MASTER CALIBRATION CO.,LTD.
547 Soi Ratchadanivat, Kwaeng Samsennok, Khet Huaykwang, Bangkok 10310
Tel. : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989
Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

Reference Standard Instrument :

Description	Certificate No.	Serial No.	Due date	Traceable thru
Data Acquisition/Switch Unit	MC 2301270	MY44020009	9 Mar 2024	MCAL
With Thermocouple Type " T " ID. No.27/1 to 27/5				

Traceability :

The measurement standard traceable to the international system of units (SI) through certificate as mentioned above

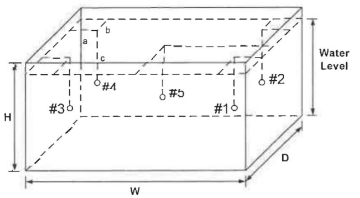
1. Calibration Procedure:

This Instrument was calibration according to ASTM E715 - 2007 by comparison with calibrated sensor under no load condition. The sensor were placed on five points and located one sensor in each of the eigh corners of the chamber and was away from the each wall of 5 cm to 10 cm. And placed the five sensor within 2.5 cm of the geometric center of the chamber.

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. The reference sensor should preferably be located at the geometric center of the chamber.

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

Overall Variation - The Difference of the maximum and minmum measured temperatures throughout observation.



- Overall Ambient Temperature around the Chamber veriation : 1.3 °C
- Overall Line Voltage variation : 0.0 V
- Chamber Size (W*H*D) : 50 cm x 12 cm x 30 cm
- Water Level : 7 cm

Checked by : [redacted]

MCAL
MASTER CALIBRATION CO.,LTD.
547 Soi Ratchadanivat, Kwaeng Samsennok, Khet Huaykwang, Bangkok 10310
Tel. : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989
Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

2. Result of calibration :

Temperature Measurement Accuracy Test

Indicating Temperature (°C)	Measured Temperature (°C) at Spread Locations					Uncertainty (±°C)
	#1	#2	#3	#4	Ref. #5	
45.0	44.5	44.4	44.5	44.5	44.6	0.45

Chamber Characterization Result

Desired Temperature (°C)	Controller Temperature (°C)	Indicating Temperature (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
44.5	45.0	45.0	0.62	0.88	1.5

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2.0, providing a level of confidence of approximately 95 %.

This certificate will certify of the calibrated equipment only.

End of Certificate

Checked by : [redacted]

MCAL
MASTER CALIBRATION CO.,LTD.

Master Calibration Co.,Ltd.
547 Soi Ratchadanivat, Kwaeng Samsennok, Khet Huaykwang, Bangkok 10310
Tel. : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989
Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

Certificate of Calibration

NSC-TISI-TIS 17025
CALIBRATION 0183

TEMPERATURE
CONTROLLER ENCLOSURES

Certificate No.: MC 2314270

Customer	: Water Analysis Center Co., Ltd. 1/94 Moo 5, T.Kantham, A.U-Thai, Ayutthaya 13210.		
Reference Job No.	: 23-2833	Received Date	: 15 December 2023
Description	: Incubator		
Manufacturer	: Memmert	Model	: IN260
Serial No.	: D619.0170	ID. No.	: WWL 0192
Marking	: Additionally for the purpose of identification by this laboratory a label marked with this certificate number (MC 2314270) has been attached to the case.		
Method	: In-House calibration procedure MWI-T-033 this method is reference to TLAS G-20 "Temperature Controlled Enclosures".		
Location of Calibration	: Water Analysis Center Co., Ltd. ; Laboratory.		
Environmental Conditions	: Ambient Temperature : (25.2 to 25.6) °C Relative Humidity : (65.4 to 66.2) %		
Date of Calibration	: 15 December 2023	Date of Issue	: 19 December 2023

Checked by : [redacted]
Chalermkit Rakphada
(Calibration Engineer)

Approved by : [redacted]
Aittipong Kanjanaswasit
(Technical Manager)

The uncertainties are for a confidence probability of approximately 95%

This certificate is issued in accordance with the conditions of accreditation granted by the National Standardization Council of Thailand-Office of the National Standardization Council that 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 Master Calibration Co.,Ltd.

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Tel. : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989
Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

Reference Standard Instrument :

Description	Certificate No.	Serial No.	Due date	Traceable thru
Data Acquisition/Switch Unit	MC 2214032	MY41029992	26 Dec 2023	MCAL
With Thermocouple Type " T " ID. No.31/1 to 31/9				

Traceability :

The measurement standard traceable to the international system of units (SI) through certificate as mentioned above

1. Calibration Procedure:

This Instrument was calibration according to TLAS G-20 by comparison with calibrated thermocouple type T under no load condition. The Thermocouples were placed on nine points and located one thermocouple in each of the eigh corners of the chamber and was away from the each wall of 5 cm to 10 cm. And placed the ninth thermocouple within 2.5 cm of the geometric center of the chamber.

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. The reference sensor should preferably be located at the geometric center of the chamber.

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

Overall Variation - The Difference of the maximum and minmum measured temperatures throughout observation.

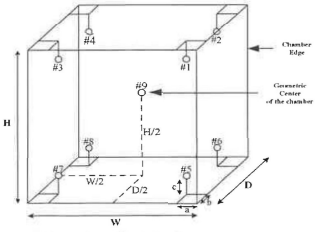


Figure 1 : Sensor Installation Location

Overall Ambient Temperature around the Chamber veriation : 0.4 °C
Overall Line Voltage variation : 0.0 V
Chamber Size (W*H*D) : 65 cm x 80 cm x 50 cm

Checked by : [redacted]

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2. Result of calibration :

Temperature Measurement Accuracy Test

Indicating Temperature	Measured Temperature (°C) at Spread Locations									Uncertainty
(°C)	#1	#2	#3	#4	#5	#6	#7	#8	Ref. #9	(±°C)
35.0	35.2	35.2	35.2	35.2	35.1	35.1	35.0	35.1	35.1	0.44

Chamber Characterization Result

Desired Temperature (°C)	Controller Temperature (°C)	Indicating Temperature (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
35.0	35.0	35.0	0.13	0.21	0.4

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

This certificate will certify of the calibrated equipment only.

End of Certificate

Checked by : [redacted]