

ภาคผนวกที่ 2.5

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ผลการตรวจวิเคราะห์คุณภาพน้ำสระว่ายน้ำ (SWIMMING POOL)



## Analysis/Test Report

Private Laboratory Registration ๖-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Swimming water

Analytical Date : 14/07/2023

Sampling Method : Grab

Report Date : 21/07/2023

Sampling Date : 13/07/2023

Report No. : WT3980766002

Received Date : 14/07/2023

Parameter	Unit	Method**	2166/07/23	Standard
			Seaside Pool	
				***
pH	-	Electrometric Method	7.6	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	1.5	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.55	0.5 – 1.0
Alkalinity	ppm	Titration Method	93	80 – 100
Calcium hardness	mg/L	Titration Method	360	250 – 600
Cyanuric acid	mg/L	Turbidimetric	37.00	30 – 60
Chloride	mg/L	Titration Method	452	<600
Ammonia	mg/L	Phenate Method	12.00	<20
Nitrate	mg/L	Nitrate Electrode	0.7400	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

(3)\*\*\*Ministry of Public Health BE.2550, Thailand for swimming pool analysis

*Ph*

(Miss.Phitsinee Phetcharut)

Analyst

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21/07/2023



*Sirip*

(Mrs.Siripen Vitethap)

Laboratory Supervisor

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21/07/2023

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## Analysis/Test Report

Private Laboratory Registration 3-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Swimming water

Analytical Date : 14/07/2023

Sampling Method : Grab

Report Date : 21/07/2023

Sampling Date : 13/07/2023

Report No. : WT3980766003

Received Date : 14/07/2023

Parameter	Unit	Method**	2168/07/23	Standard
			Laquita Pool	
pH	-	Electrometric Method	7.6	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	1.5	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.62	0.5 – 1.0
Alkalinity	ppm	Titration Method	95	80 – 100
Calcium hardness	mg/L	Titration Method	274	250 – 600
Cyanuric acid	mg/L	Turbidimetric	43.00	30 – 60
Chloride	mg/L	Titration Method	450	<600
Ammonia	mg/L	Phenate Method	9.30	<20
Nitrate	mg/L	Nitrate Electrode	0.8500	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

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(3)\*\*\*Ministry of Public Health BE.2550, Thailand for swimming pool analysis

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(Mrs.Siripen Vitethap)

Laboratory Supervisor

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21/07/2023

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## Analysis/Test Report

### Private Laboratory Registration ๓-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Swimming water

Analytical Date : 14/07/2023

Sampling Method : Grab

Report Date : 21/07/2023

Sampling Date : 13/07/2023

Report No. : WT3980766004

Received Date : 14/07/2023

Parameter	Unit	Method**	2168/07/23	Standard
			Club House Pool	
pH	-	Electrometric Method	7.6	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	1.5	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.70	0.5 – 1.0
Alkalinity	ppm	Titration Method	96	80 – 100
Calcium hardness	mg/L	Titration Method	269	250 – 600
Cyanuric acid	mg/L	Turbidimetric	39.00	30 – 60
Chloride	mg/L	Titration Method	480	<600
Ammonia	mg/L	Phenate Method	19.00	<20
Nitrate	mg/L	Nitrate Electrode	0.7400	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

#### Remark :

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21/07/2023

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## Analysis/Test Report

### Private Laboratory Registration ๖-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Swimming water

Analytical Date : 26/08/2023

Sampling Method : Grab

Report Date : 04/09/2023

Sampling Date : 25/08/2023

Report No. : WT3980866002

Received Date : 26/08/2023

Parameter	Unit	Method**	2506/08/23	Standard
			Seaside Pool	
pH	-	Electrometric Method	7.6	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	3.0	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.78	0.5 – 1.0
Alkalinity	ppm	Titration Method	92	80 – 100
Calcium hardness	mg/L	Titration Method	300	250 – 600
Cyanuric acid	mg/L	Turbidimetric	42.00	30 – 60
Chloride	mg/L	Titration Method	378	<600
Ammonia	mg/L	Phenate Method	9.30	<20
Nitrate	mg/L	Nitrate Electrode	0.7400	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

#### Remark :

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(3)\*\*\*Ministry of Public Health BE.2550, Thailand for swimming pool analysis

*Jirapinya*

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04/09/2023

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## Analysis/Test Report

Private Laboratory Registration ๓-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Swimming water

Analytical Date : 26/08/2023

Sampling Method : Grab

Report Date : 04/09/2023

Sampling Date : 25/08/2023

Report No. : WT3980866003

Received Date : 26/08/2023

Parameter	Unit	Method**	2507/08/23	Standard
			Laquita Pool	
pH	-	Electrometric Method	7.6	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	3.0	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.90	0.5 – 1.0
Alkalinity	ppm	Titration Method	95	80 – 100
Calcium hardness	mg/L	Titration Method	303	250 – 600
Cyanuric acid	mg/L	Turbidimetric	47.00	30 – 60
Chloride	mg/L	Titration Method	189	<600
Ammonia	mg/L	Phenate Method	9.00	<20
Nitrate	mg/L	Nitrate Electrode	0.7400	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

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## Analysis/Test Report

Private Laboratory Registration ๓-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Swimming water

Analytical Date : 26/08/2023

Sampling Method : Grab

Report Date : 04/09/2023

Sampling Date : 25/08/2023

Report No. : WT3980866004

Received Date : 26/08/2023

Parameter	Unit	Method**	2508/08/23	Standard
			Club House Pool	
pH	-	Electrometric Method	7.6	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	1.5	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.95	0.5 – 1.0
Alkalinity	ppm	Titration Method	93	80 – 100
Calcium hardness	mg/L	Titration Method	320	250 – 600
Cyanuric acid	mg/L	Turbidimetric	45.00	30 – 60
Chloride	mg/L	Titration Method	266	<600
Ammonia	mg/L	Phenate Method	11.00	<20
Nitrate	mg/L	Nitrate Electrode	0.6500	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

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(3)\*\*\*Ministry of Public Health BE.2550, Thailand for swimming pool analysis



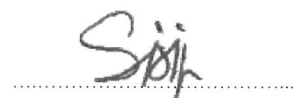
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## Analysis/Test Report

### Private Laboratory Registration ๖-๒๓๘

**Customer** : Amari Phuket Resort & Spa

**Address** : Patong Beach, Phuket 83150 Thailand

**Sample Type** : Swimming water

**Analytical Date** : 29/09/2023

**Sampling Method** : Grab

**Report Date** : 04/10/2023

**Sampling Date** : 28/09/2023

**Report No.** : WT3980966003

**Received Date** : 29/09/2023

Parameter	Unit	Method**	3132/09/23	Standard
			Club House Pool	
				***
pH	-	Electrometric Method	7.7	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	0.74	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.80	0.5 – 1.0
Alkalinity	ppm	Titration Method	94	80 – 100
Calcium hardness	mg/L	Titration Method	330	250 – 600
Cyanuric acid	mg/L	Turbidimetric	39.20	30 – 60
Chloride	mg/L	Titration Method	359	<600
Ammonia	mg/L	Phenate Method	12.30	<20
Nitrate	mg/L	Nitrate Electrode	0.7400	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

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04/10/2023

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## Analysis/Test Report

Private Laboratory Registration 3-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Swimming water

Analytical Date : 29/09/2023

Sampling Method : Grab

Report Date : 04/10/2023

Sampling Date : 28/09/2023

Report No. : WT3980966004

Received Date : 29/09/2023

Parameter	Unit	Method**	3133/09/23	Standard
			Laquita pool	
pH	-	Electrometric Method	7.9	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	0.92	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.60	0.5 – 1.0
Alkalinity	ppm	Titration Method	91	80 – 100
Calcium hardness	mg/L	Titration Method	290	250 – 600
Cyanuric acid	mg/L	Turbidimetric	39.00	30 – 60
Chloride	mg/L	Titration Method	470	<600
Ammonia	mg/L	Phenate Method	8.20	<20
Nitrate	mg/L	Nitrate Electrode	0.9500	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

(3)\*\*\*Ministry of Public Health BE.2550, Thailand for swimming pool analysis



(Miss.Jirapinya Tara)

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04/10/2023





(Mrs.Siripen Vitethap)

Laboratory Supervisor

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## Analysis/Test Report

### Private Laboratory Registration ๖-๒๓๘

**Customer** : Amari Phuket Resort & Spa

**Address** : Patong Beach, Phuket 83150 Thailand

**Sample Type** : Swimming water

**Analytical Date** : 29/09/2023

**Sampling Method** : Grab

**Report Date** : 04/10/2023

**Sampling Date** : 28/09/2023

**Report No.** : WT3980366005

**Received Date** : 29/09/2023

Parameter	Unit	Method**	3134/09/23	Standard
			Seaside Pool	
pH	-	Electrometric Method	8.0	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	0.88	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.91	0.5 – 1.0
Alkalinity	ppm	Titration Method	89	80 – 100
Calcium hardness	mg/L	Titration Method	300	250 – 600
Cyanuric acid	mg/L	Turbidimetric	39.10	30 – 60
Chloride	mg/L	Titration Method	228	<600
Ammonia	mg/L	Phenate Method	7.50	<20
Nitrate	mg/L	Nitrate Electrode	0.9500	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

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04/10/2023

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บริษัท ดีแอนด์จี คอร์ปอเรชั่น จำกัด  
D&G CORPORATION CO.,LTD.

307/223 ถนนสุขุมวิท แขวงบางขุนพรหม เขตบางกอกน้อย กรุงเทพมหานคร 10700 โทร. 02-868-6654 โทรสาร. 02-868-6543  
307/223 Charansriwong Rd. Bangkoknoi, Bangkok 10700 Thailand Tel. (662)868-6654 Fax. (662)868-6543

## Analysis/Test Report

### Private Laboratory Registration 1-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Swimming water

Analytical Date : 28/10/2023

Sampling Method : Grab

Report Date : 03/11/2023

Sampling Date : 28/10/2023

Report No. : WT3981066002

Received Date : 28/10/2023

Parameter	Unit	Method**	3439/10/23	Standard
			Seaside Pool	
pH	-	Electrometric Method	7.7	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	0.74	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.62	0.5 – 1.0
Alkalinity	ppm	Titration Method	91	80 – 100
Calcium hardness	mg/L	Titration Method	292	250 – 600
Cyanuric acid	mg/L	Turbidimetric	39.60	30 – 60
Chloride	mg/L	Titration Method	193	<600
Ammonia	mg/L	Phenate Method	8.40	<20
Nitrate	mg/L	Nitrate Electrode	0.7100	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

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(Miss.Jirapinya Tara)

Analyst

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03/11/2023



  
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Laboratory Supervisor

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03/11/2023

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## Analysis/Test Report

Private Laboratory Registration ๖-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Swimming water

Analytical Date : 28/10/2023

Sampling Method : Grab

Report Date : 03/11/2023

Sampling Date : 28/10/2023

Report No. : WT3981066003

Received Date : 28/10/2023

Parameter	Unit	Method**	3440/10/23	Standard
			Laquita Pool	
pH	-	Electrometric Method	7.7	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	0.95	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.63	0.5 – 1.0
Alkalinity	ppm	Titration Method	90	80 – 100
Calcium hardness	mg/L	Titration Method	284	250 – 600
Cyanuric acid	mg/L	Turbidimetric	42.00	30 – 60
Chloride	mg/L	Titration Method	271	<600
Ammonia	mg/L	Phenate Method	9.00	<20
Nitrate	mg/L	Nitrate Electrode	0.7700	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

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03/11/2023



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03/11/2023

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## Analysis/Test Report

### Private Laboratory Registration 3-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Swimming water

Analytical Date : 28/10/2023

Sampling Method : Grab

Report Date : 03/11/2023

Sampling Date : 28/10/2023

Report No. : WT3981066004

Received Date : 28/10/2023

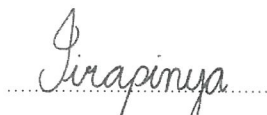
Parameter	Unit	Method**	3441/10/23	Standard
			Club House Pool	
				***
pH	-	Electrometric Method	7.4	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	0.83	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.55	0.5 – 1.0
Alkalinity	ppm	Titration Method	95	80 – 100
Calcium hardness	mg/L	Titration Method	290	250 – 600
Cyanuric acid	mg/L	Turbidimetric	43.00	30 – 60
Chloride	mg/L	Titration Method	184	<600
Ammonia	mg/L	Phenate Method	16.00	<20
Nitrate	mg/L	Nitrate Electrode	0.8400	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

(3)\*\*\*Ministry of Public Health BE.2550, Thailand for swimming pool analysis



(Miss.Jirapinya Tara)

Analyst

3-๒๓๘-3-๐๐๐๒

03/11/2023





(Mrs.Siripen Vitethap)

Laboratory Supervisor

3-๒๓๘-3-๐๐๐๑

03/11/2023

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## Analysis/Test Report

### Private Laboratory Registration ๖-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Swimming water

Analytical Date : 25/11/2023

Sampling Method : Grab

Report Date : 30/11/2023

Sampling Date : 24/11/2023

Report No. : WT3981166002

Received Date : 25/11/2023

Parameter	Unit	Method**	3749/11/23	Standard
			Seaside Pool	
				***
pH	-	Electrometric Method	7.6	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	0.81	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.66	0.5 – 1.0
Alkalinity	ppm	Titration Method	90	80 – 100
Calcium hardness	mg/L	Titration Method	277	250 – 600
Cyanuric acid	mg/L	Turbidimetric	39.00	30 – 60
Chloride	mg/L	Titration Method	1411	<600
Ammonia	mg/L	Phenate Method	6.20	<20
Nitrate	mg/L	Nitrate Electrode	0.7300	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

(3)\*\*\*Ministry of Public Health BE.2550, Thailand for swimming pool analysis

*Jirapinya*

(Miss.Jirapinya Tara)

Analyst

๖-๒๓๘-๖-๐๐๐๒

30/11/2023



*Siripen*

(Mrs.Siripen Vitethap)

Laboratory Supervisor

๖-๒๓๘-๖-๐๐๐๑

30/11/2023

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## Analysis/Test Report

Private Laboratory Registration 3-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Swimming water

Analytical Date : 25/11/2023

Sampling Method : Grab

Report Date : 30/11/2023

Sampling Date : 24/11/2023

Report No. : WT3981166003

Received Date : 25/11/2023

Parameter	Unit	Method**	3750/11/23	Standard
			Laquita Pool	
pH	-	Electrometric Method	7.6	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	0.90	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.74	0.5 – 1.0
Alkalinity	ppm	Titration Method	90	80 – 100
Calcium hardness	mg/L	Titration Method	390	250 – 600
Cyanuric acid	mg/L	Turbidimetric	40.00	30 – 60
Chloride	mg/L	Titration Method	360	<600
Ammonia	mg/L	Phenate Method	18.00	<20
Nitrate	mg/L	Nitrate Electrode	0.7100	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

(3)\*\*\*Ministry of Public Health BE.2550, Thailand for swimming pool analysis



(Miss.Jirapinya Tara)

Analyst

3-๒๓๘-๗-๐๐๐๒

30/11/2023





(Mrs.Siripen Vitethap)

Laboratory Supervisor

3-๒๓๘-๗-๐๐๐๑

30/11/2023

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## Analysis/Test Report

### Private Laboratory Registration ๖-๒๓๘

**Customer** : Amari Phuket Resort & Spa

**Address** : Patong Beach, Phuket 83150 Thailand

**Sample Type** : Swimming water

**Analytical Date** : 25/11/2023

**Sampling Method** : Grab

**Report Date** : 30/11/2023

**Sampling Date** : 24/11/2023

**Report No.** : WT3981166004

**Received Date** : 25/11/2023

Parameter	Unit	Method**	3751/11/23	Standard
			Club House Pool	
pH	-	Electrometric Method	7.6	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	0.95	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.74	0.5 – 1.0
Alkalinity	ppm	Titration Method	92	80 – 100
Calcium hardness	mg/L	Titration Method	300	250 – 600
Cyanuric acid	mg/L	Turbidimetric	44.20	30 – 60
Chloride	mg/L	Titration Method	354	<600
Ammonia	mg/L	Phenate Method	17.20	<20
Nitrate	mg/L	Nitrate Electrode	0.7400	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

(3)\*\*\*Ministry of Public Health BE.2550, Thailand for swimming pool analysis

*Jirapinya*

(Miss.Jirapinya Tara)

Analyst

๖-๒๓๘-๖-๐๐๐๒

30/11/2023



*Sirip*

(Mrs.Siripen Vitethap)

Laboratory Supervisor

๖-๒๓๘-๖-๐๐๐๑

30/11/2023

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## Analysis/Test Report

### Private Laboratory Registration ๖-๒๓๘

**Customer** : Amari Phuket Resort & Spa

**Address** : Patong Beach, Phuket 83150 Thailand

**Sample Type** : Swimming water

**Analytical Date** : 27/12/2023

**Sampling Method** : Grab

**Report Date** : 05/01/2024

**Sampling Date** : 26/12/2023

**Report No.** : WT3981266002

**Received Date** : 27/12/2023

Parameter	Unit	Method**	4020/12/23	Standard
			Seaside Pool	
				***
pH	-	Electrometric Method	7.9	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	0.60	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.52	0.5 – 1.0
Alkalinity	ppm	Titration Method	99	80 – 100
Calcium hardness	mg/L	Titration Method	290	250 – 600
Cyanuric acid	mg/L	Turbidimetric	45.50	30 – 60
Chloride	mg/L	Titration Method	411	<600
Ammonia	mg/L	Phenate Method	8.30	<20
Nitrate	mg/L	Nitrate Electrode	0.8500	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

(3)\*\*\*Ministry of Public Health BE.2550, Thailand for swimming pool analysis

*Jirapinya*

(Miss.Jirapinya/Tara)

Analyst

๖-๒๓๘-๖-๐๐๐๒

05/01/2024



*Siripen*

(Mrs.Siripen Vitethap)

Laboratory Supervisor

๖-๒๓๘-๖-๐๐๐๑

05/01/2024

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บริษัท ดีแอนดจี คอร์ปอเรชั่น จำกัด  
D&G CORPORATION CO.,LTD.

307/223 ถนนเจริญสุขุมวิท แขวงบางขุนพรหม เขตบางกอกน้อย กรุงเทพฯ 10700 โทร. 02-8668-6654 โทรสาร. 02-8668-6543  
307/223 Charansanitwong Rd. Bangkhunsi, Bangkoknoi, Bangkok 10700 Thailand Tel. (662)868-6654 Fax. (662)868-6543

## Analysis/Test Report

Private Laboratory Registration 3-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Swimming water

Analytical Date : 27/12/2023

Sampling Method : Grab

Report Date : 05/01/2024

Sampling Date : 26/12/2023

Report No. : WT3981266003

Received Date : 27/12/2023

Parameter	Unit	Method**	4021/12/23	Standard
			Laquita Pool	
pH	-	Electrometric Method	7.9	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	0.63	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.59	0.5 – 1.0
Alkalinity	ppm	Titration Method	98	80 – 100
Calcium hardness	mg/L	Titration Method	300	250 – 600
Cyanuric acid	mg/L	Turbidimetric	38.50	30 – 60
Chloride	mg/L	Titration Method	390	<600
Ammonia	mg/L	Phenate Method	10.30	<20
Nitrate	mg/L	Nitrate Electrode	0.9800	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

(3)\*\*\*Ministry of Public Health BE.2550, Thailand for swimming pool analysis

  
(Miss.Jirapinya Tara)

Analyst

3-๒๓๘-๖-๐๐๐๒

05/01/2024



  
(Mrs.Siripen Vitethap)

Laboratory Supervisor

3-๒๓๘-๖-๐๐๐๑

05/01/2024

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## Analysis/Test Report

Private Laboratory Registration 3-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Swimming water

Analytical Date : 27/12/2023

Sampling Method : Grab

Report Date : 05/01/2024

Sampling Date : 26/12/2023

Report No. : WT3981266004

Received Date : 27/12/2023

Parameter	Unit	Method**	4022/12/23	Standard
			Club House Pool	
				***
pH	-	Electrometric Method	7.6	7.2 – 8.4
Free chlorine	ppm	Photometer (DPD)	0.66	0.6 – 1.0
Combined chlorine	ppm	Photometer (DPD)	0.54	0.5 – 1.0
Alkalinity	ppm	Titration Method	98	80 – 100
Calcium hardness	mg/L	Titration Method	233	250 – 600
Cyanuric acid	mg/L	Turbidimetric	41.20	30 – 60
Chloride	mg/L	Titration Method	320	<600
Ammonia	mg/L	Phenate Method	7.20	<20
Nitrate	mg/L	Nitrate Electrode	0.6200	<50
Coliform, Total	MPN/1000mL	APHA: 9221 B	ND	<10
Coliform, Fecal	MPN/1000mL	APHA: 9221 E	ND	Not detected
E.coli	MPN/1000mL	APHA: 9221 G	ND	Not detected
Staphylococcus aureus	MPN/1000mL	APHA: 9213 B	ND	Not detected
Pseudomonas aeruginosa	MPN/1000mL	ISO 1622	ND	Not detected
Appearance		Observation	Clear	

Remark :

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

(3)\*\*\*Ministry of Public Health BE.2550, Thailand for swimming pool analysis


  
(Miss.Jirapinya Tara)

Analyst

3-๒๓๘-๗-๐๐๐๒

05/01/2024



  
(Mrs.Siripen Vitethap)

Laboratory Supervisor

3-๒๓๘-๗-๐๐๐๑

05/01/2024

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ภาคผนวกที่ 2.6

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ผลการตรวจวิเคราะห์คุณภาพน้ำใช้ (WATER SUPPLY)





## Analysis/Test Report

### Private Laboratory Registration ๖-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Tap Water

Analytical Date : 14/07/2023

Sampling Method : Grab

Report Date : 21/07/2023

Sampling Date : 13/07/2023

Report No. : WT3980766001

Received Date : 14/07/2023

Parameter	Unit	Method**	2165/07/23	Standard ***
			300 cubic meter water tank	
Coliform, Total	MPN/100 mL	APHA: 9221 B	ND	Not detected
Coliform, Fecal	MPN/100 mL	APHA: 9221 E	ND	Not detected
Appearance		Observation	Clear	

Remark : :

- (1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work  
(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017  
(3)\*\*\*Water quality standards Ministry of Public Health, Department of Health,2020

(Miss. Phitsinee Phetcharut)

Analyst

๖-๒๓๘-๖-๖๘๐๐

21/07/2023



(Mrs. Siripen Vitethap)

Laboratory Supervisor

๖-๒๓๘-๖-๖๘๐๐

21/07/2023

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## Analysis/Test Report

### Private Laboratory Registration ๖-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Tap Water

Analytical Date : 26/08/2023

Sampling Method : Grab

Report Date : 04/09/2023

Sampling Date : 25/08/2023

Report No. : WT3980866001

Received Date : 26/08/2023

Parameter	Unit	Method**	2505/08/23	Standard
			300 cubic meter water tank	
Coliform, Total	MPN/100 mL	APHA: 9221 B	ND	Not detected
Coliform, Fecal	MPN/100 mL	APHA: 9221 E	ND	Not detected
Appearance		Observation	Clear	

Remark :

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

(3)\*\*\*Water quality standards Ministry of Public Health, Department of Health,2020

*Jirapinya*

(Miss.Jirapinya Tara)

Analyst

๖-๒๓๘-๖-๐๐๐๒

04/09/2023



*Siripen*

(Mrs.Siripen Vitethap)

Laboratory Supervisor

๖-๒๓๘-๖-๐๐๐๑

04/09/2023

Do not copy some scuffing Do not modify this report.



## Analysis/Test Report

### Private Laboratory Registration ๖-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Tap Water

Analytical Date : 29/09/2023

Sampling Method : Grab

Report Date : 04/10/2023

Sampling Date : 28/09/2023

Report No. : WT3980966001

Received Date : 29/09/2023

Parameter	Unit	Method**	3131/09/23	Standard ***
			Cold water Engineer room.	
*pH	-	Electrometric Method	7.3	6.5-8.5
*Total Dissolved Solids	mg/L	Dried at 180 °C	150	<1,000
Total Hardness	mg/L	Titration Method	23	<500
Chloride	mg/L	Titration Method	41	<250
Turbidity	Silica Scale Unit	Nephelometric Method	0.2	<15
Color	Hazen Unit	Visual Comparison Method	2	<15
Sulfate	mg/L as $\text{SO}_4^{2-}$	Turbidimetric	78	<250
Fluoride	mg/L	SPADNS	0.1	<0.7
N-Nitrate	mg/L	Nitrate Electrode	0.74	<50
Manganese	mg/L	ICP	ND	<0.3
Appearance		Observation	Clear	

Remark:

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

(3)\*\*\*Water quality standards Ministry of Public Health, Department of Health,2020



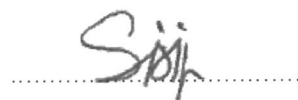
(Miss.Jirapinya Tara)

Analyst

๖-๒๓๘-๖-๐๐๐๒

04/10/2023





(Mrs.Siripen Vitethap)

Laboratory Supervisor

๖-๒๓๘-๖-๐๐๐๑

04/10/2023

Do not copy some scuffing Do not modify this report.



## Analysis/Test Report

### Private Laboratory Registration ๖-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Tap Water

Analytical Date : 29/09/2023

Sampling Method : Grab

Report Date : 04/10/2023

Sampling Date : 28/09/2023

Report No. : WT3980966002

Received Date : 29/09/2023

Parameter	Unit	Method**	3131/09/23	Standard ***
			Cold water Engineer room.	
Copper	mg/L	ICP	ND	<1.0
Total Iron	mg/L	Photometer (Phenanthroline)	ND	<0.5
Zinc	mg/L	ICP	0.094	<3.0
Mercury	mg/L	ICP- Hydried	<0.0005	<0.001
Lead	mg/L	IPC	<0.005	<0.01
Arsenic	mg/L	ICP- Hydried	<0.001	<0.01
Chromium	mg/L	ICP	0.002	<0.05
Cadmium	mg/L	ICP	<0.001	<0.003
Coliform, Total	MPN/100 mL	APHA: 9221 B	ND	Not Detected
Coliform, Fecal	MPN/100 mL	APHA:92121 E	ND	Not Detected
Appearance		Observation	Clear	

Remark:

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

(3)\*\*\*Water quality standards Ministry of Public Health, Department of Health,2020

  
(Miss.Jirapinya Tara)

Analyst

๖-๒๓๘-๖-๐๐๐๒

04/10/2023



  
(Mrs.Siripen Vitethap)

Laboratory Supervisor

๖-๒๓๘-๖-๐๐๐๓

04/10/2023

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## Analysis/Test Report

### Private Laboratory Registration ๓-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Tap Water

Analytical Date : 28/10/2023

Sampling Method : Grab

Report Date : 03/11/2023

Sampling Date : 28/10/2023

Report No. : WT3981066001

Received Date : 28/10/2023

Parameter	Unit	Method**	3438/10/23	Standard ***
			300 cubic meter water tank	
Coliform, Total	MPN/100 mL	APHA: 9221 B	ND	Not detected
Coliform, Fecal	MPN/100 mL	APHA: 9221 E	ND	Not detected
Appearance		Observation	Clear	

Remark :

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

(3)\*\*\*Water quality standards Ministry of Public Health, Department of Health,2020

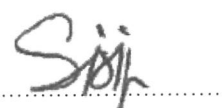
  
(Miss.Jirapinya Tara)

Analyst

๓-๒๓๘-๗-๐๐๐๒

03/11/2023





(Mrs.Siripen Vitethap)

Laboratory Supervisor

๓-๒๓๘-๗-๐๐๐๑

03/11/2023

Do not copy some scuffing Do not modify this report.



## Analysis/Test Report

### Private Laboratory Registration ๓-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Tap Water

Analytical Date : 25/11/2023

Sampling Method : Grab

Report Date : 30/11/2023

Sampling Date : 24/11/2023

Report No. : WT3981166001

Received Date : 25/11/2023

Parameter	Unit	Method**	3748/11/23	Standard
			300 cubic meter water tank	
Coliform, Total	MPN/100 mL	APHA: 9221 B	ND	Not detected
Coliform, Fecal	MPN/100 mL	APHA: 9221 E	ND	Not detected
Appearance		Observation	Clear	

Remark :

(1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work

(2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017

(3)\*\*\*Water quality standards Ministry of Public Health, Department of Health,2020



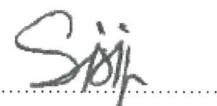
(Miss.Jirapinya Tara)

Analyst

๓-๒๓๘-๓-๐๐๐๒

30/11/2023





(Mrs.Siripen Vitethap)

Laboratory Supervisor

๓-๒๓๘-๓-๐๐๐๑

30/11/2023

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## Analysis/Test Report

### Private Laboratory Registration ๖-๒๓๘

Customer : Amari Phuket Resort & Spa

Address : Patong Beach, Phuket 83150 Thailand

Sample Type : Tap Water

Analytical Date : 27/12/2023

Sampling Method : Grab

Report Date : 05/01/2024

Sampling Date : 26/12/2023

Report No. : WT3981266001

Received Date : 27/12/2023

Parameter	Unit	Method**	4023/12/23	Standard
			300 cubic meter water tank	
Coliform, Total	MPN/100 mL	APHA: 9221 B	ND	Not detected
Coliform, Fecal	MPN/100 mL	APHA: 9221 E	ND	Not detected
Appearance		Observation	Clear	

Remark :

- (1)\* Types of pollutants allowed to apply for the registration of private analytical laboratories. Department of Industrial Work
- (2)\*\* Method Based on Standard Methods for The examination of Water & Wastewater 23<sup>rd</sup> Edition, 2017
- (3)\*\*\*Water quality standards Ministry of Public Health, Department of Health,2020

*Jirapinya*

(Miss.Jirapinya Tara)

Analyst

๖-๒๓๘-๖-๐๐๐๒

05/01/2024



*Siripen*

(Mrs.Siripen Vitethap)

Laboratory Supervisor

๖-๒๓๘-๖-๐๐๐๑

05/01/2024

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ภาคผนวกที่ 3

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เอกสารขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน



ที่ อก ๐๓๒๒/ ๑๗๕๖๕



กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๘ ธ.ค. ๒๕๖๖

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เช่าเทิร์นไทยคอนซัลติ้ง จำกัด

อ้างถึง คำขอต่ออายุของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๑๐ พฤศจิกายน ๒๕๖๖

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เช่าเทิร์นไทยคอนซัลติ้ง จำกัด จำนวน ๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เช่าเทิร์นไทยคอนซัลติ้ง จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียน  
ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๑๗๖ สถานที่ตั้ง เลขที่ ๕๙/๕๕ หมู่ที่ ๕ ตำบลศรีสุนทร อำเภออ่าวกลาง  
จังหวัดภูเก็ต ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เช่าเทิร์นไทยคอนซัลติ้ง จำกัด ต่ออายุหนังสือ  
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

๑) นายพิมุข สอนมี

ทะเบียนเลขที่ ว-๑๗๖-ค-๐๐๐๑

๒) นายศิริพงศ์ พะสริ

ทะเบียนเลขที่ ว-๑๗๖-ค-๐๐๐๒

๓) นางเพ็ญภา จันทรเพ็ญ

ทะเบียนเลขที่ ว-๑๗๖-ค-๐๐๐๓

๔) นางสาวพรวิษา จินรัตน์

ทะเบียนเลขที่ ว-๑๗๖-ค-๐๐๐๔

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

๑) นางสาวกรรณิกา แก้วสามเขียว

ทะเบียนเลขที่ ว-๑๗๖-จ-๐๐๐๑

๒) นางสาวศิริรัตน์ นิเทศนพกุล

ทะเบียนเลขที่ ว-๑๗๖-จ-๐๐๐๒

๓) นางสาวจุฑาทิพย์ ชูถึง

ทะเบียนเลขที่ ว-๑๗๖-จ-๐๐๐๓

๔) นางสาวปรีชญา หมุกแก้ว

ทะเบียนเลขที่ ว-๑๗๖-จ-๐๐๐๔

๕) นางสาวบุษยา ประกอบแสง

ทะเบียนเลขที่ ว-๑๗๖-จ-๐๐๐๕

๖) นางสาวจุฑาภรณ์ จุฑามาศย์

ทะเบียนเลขที่ ว-๑๗๖-จ-๐๐๐๖

๗) นางสาวกรรณนิการ์ ประทุมเพชร

ทะเบียนเลขที่ ว-๑๗๖-จ-๐๐๐๗

๘) นางสาวสุธาสินี ละเมาะ

ทะเบียนเลขที่ ว-๑๗๖-จ-๐๐๐๘

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย ตามสิ่งที่ส่งมาด้วย

**COPY**

หนังสือ....



หนังสือฉบับนี้จะหมดอายุในวันที่ ๑ ธันวาคม ๒๕๖๙ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ทั้งนี้สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

ห.

(นายเนเรศวร์ ตริยงค์)

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคใต้  
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

COPY

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคใต้

โทร. ๐ ๗๔๓๒ ๕๐๒๙, ๐ ๗๔๘๙ ๐๖๓๔ ต่อ ๕๒๐๑

ไปรษณีย์อิเล็กทรอนิกส์ sirw@diw.mail.go.th

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เช้าเทิร์นไทยคอนซัลติ้ง จำกัด เลขทะเบียน ว-๑๗๖  
ที่ อก ๐๓๒๒/ ลงวันที่

ขอข่ายสารมลพิษที่ได้รับการขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๙ รายการ  
น้ำเสีย จำนวน 9 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Biochemical Oxygen Demand	5-Day BOD Test, Azide Modification Method
2	Chemical Oxygen Demand	Closed Reflux, Titrimetric Method
3	Oil & Grease	Liquid-Liquid, Partition-Gravimetric Method
4	pH	Electrometric Method
5	Sulfide	Iodometric Method
6	Temperature	Laboratory and Field Method
7	Total Dissolved Solids	Dried at 180 °C
8	Total Kjeldahl Nitrogen	Macro-Kjeldahl, Titrimetric Method
9	Total Suspended Solids	Dried at 103-105 °C

#### เอกสารอ้างอิง

APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 24<sup>th</sup> ed.  
Washington, DC: APHA, 2023.

COPY

นุชนา รัตนสุภา  
(นางสาวบุษยา รัตนสุภา)  
นักวิทยาศาสตร์ชำนาญการ



ภาคผนวกที่ 4

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เอกสารสอบเทียบอุปกรณ์เครื่องมือห้องปฏิบัติการ





PREMIER SYSTEM ENGINEERING CO., LTD.  
123 Moo 8 Kanjanavanit Rd., Banpru, Hatyai, Songkhla 90250

E-mail : pse-cal@stranggroup.com, PSE : (074)222912 Tel. : 084-2148162, 084-2148165, 074-222900-9



## CALIBRATION CERTIFICATE

CERTIFICATE No. : T23-1651

CSR No. : 230559

Page : 1 of 4

Customer : Southern Thai Consulting Co., Ltd.  
59/45 Moo5 Satsontorny, Talang, Phuket  
83110  
Equipment : Hot Air Oven  
Manufacturer : Binder  
Model : FD 56  
Serial No. : 2021000003365  
ID. No. :  
Resolution : 1 °C  
Instrument Condition : Good Condition  
Location of Calibration : Customer Laboratory  
Ambient Temperature : (30 ± 15) °C  
Relative Humidity : (60 ± 20) %  
Date of Received : 17 May 2023  
Date of Calibration : 17 May 2023  
Date of Issued : 20 May 2023

COPY

APPROVED BY :

Calibrated By : Mr. Ahiwat Sanachiewa  
(Temperature Supervisor)

APPROVED SIGNATORY  
/ Mr. PORNCHOL BUNYAN (Calibration Manager)  
/ Mr. NICHOLAI ABEN (Quality Manager)  
/ Mr. BUNYAT SONGKARNARAT (Technical Manager)

This certificate may not be reproduced other than in full except with the prior written approval of PREMIER SYSTEM ENGINEERING CO., LTD.  
The uncertainties are for a confidence probability of approximately 95 %.



PSE-CAL

c166419



CERTIFICATE No. : T23-1651

CSR No. : 230559

Page : 2 of 4

Equipment : Hot Air Oven  
Manufacturer : Binder  
Model : FD 56  
Serial No. : 2021000003365  
ID. No. :  
Date of Received : 17 May 2023  
Date of Calibration : 17 May 2023

### REFERENCE STANDARD INSTRUMENT :

Instrument Type	Model	Serial No.	Cert. No.	Due Date	Traceability
Digital Thermometer with Sensor	SA970 A	MY 44012662	DA1903/0722	23/07/2023	PSI

### CALIBRATION METHOD :

In house method : CAW3.11.1a, based on ASTM E 113 : 1994 (re approved 2011)

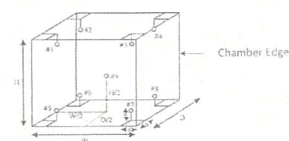
### TRACEABILITY :

This Calibration Certificate is traceable to national standards which realize the unit of measurement according to the International System of Unit (SI) through:

PSI : Premier System Engineering Co., Ltd. JNSC-TTSL-TIS-17025 CALIBRATION (V20)

### CALIBRATION RESULTS :

Sensor Installation Diagram



Dimension of the chamber : W x H x D = 36 x 42 x 38 cm  
Sensor Installation : a x b x c = 5 x 5 x 5 cm

COPY

The uncertainties are for a confidence probability of approximately 95 %.  
The above results are valid exclusively for calibration sample as mentioned in the report.  
This result of calibration was found accurate as shown on date and place of calibration only.

c166419



CERTIFICATE NO. : T23-1651

CSR No. : 230559

Page : 3 of 4

Equipment : Hot Air Oven  
Manufacturer : Binder  
Model : FD 56  
Serial No. : 2021000003365  
ID. No. :  
Date of Received : 17 May 2023  
Date of Calibration : 17 May 2023

### CALIBRATION RESULTS : (Cont.)

(1) Without Adjustment

(2) After Adjustment

#### Temperature Measurement Accuracy Test

The measurement results of the hot air oven and associated are reported in the manner as shown below

Cal Point (°C)	Measured Standard Temperature (°C) at Spread Locations								Uncertainty (± °C)	
	#1	#2	#3	#4	#5	#6	#7	#8	Ref. 9	
104	104.30	104.65	104.14	103.76	104.51	104.39	103.86	103.69	104.34	0.65
180	179.59	180.40	180.29	179.12	180.57	179.59	177.99	177.45	178.73	0.90

#### Hot Air Oven Performance Result

The performance of the hot air oven are reported as shown below

Cal Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Chamber Stability (± °C)	Chamber Uniformity (± °C)	Overall Variation (± °C)
104	105	105	0.14	0.58	1.0
180	180	180	0.42	2.0	3.4

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UUC : Unit Under Calibration

The uncertainties are for a confidence probability of approximately 95 %.  
The above results are valid exclusively for calibration sample as mentioned in the report.  
This result of calibration was found accurate as shown on date and place of calibration only.

c166419

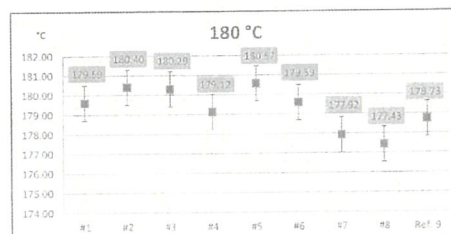
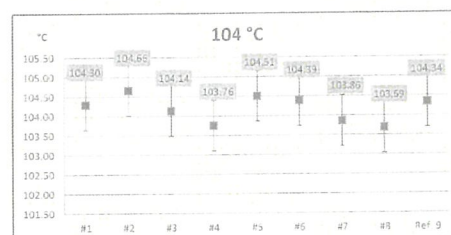


CERTIFICATE NO. : T23-1651

CSR No. : 230559

Page : 4 of 4

### Report Graph



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The above results are valid exclusively for calibration sample as mentioned in the report.  
This result of calibration was found accurate as shown on date and place of calibration only.

End



PREMIER SYSTEM ENGINEERING CO., LTD.

123 Moo 8 Kanjanavanit Rd., Banpru, Hatyai, Songkhla 90250  
E-mail : pse-cal@nitrangroup.com ,Pax : (074)222912 Tel. : 084-2148162, 084-2148165, 074-222900-9



## CALIBRATION CERTIFICATE

CERTIFICATE No. : T23-1652

CSR No. : 230559

Page : 1 of 4

Customer : Southern Thai Consulting Co., Ltd.  
59/45 Moo5 Srisoonterea, Taling, Phuket  
83110

Equipment : Water Bath  
Manufacturer : Memmert  
Model : WNB 22  
Serial No. : L519.1143  
ID. No. :  
Resolution : 0.1 °C  
Instrument Condition : Good Condition  
Location of Calibration : Customer Laboratory  
Ambient Temperature : (30 ± 10) °C  
Relative Humidity : (50 ± 20) %  
Date of Received : 17-May-2023  
Date of Calibration : 17-May-2023  
Date of Issued : 20-May-2023

APPROVED BY :

Calibrated By : Mr. Ahiwan Sapachewra  
(Temperature Supervisor)

APPROVED SIGNATORY  
MR. PRAPONG RATTANAKAN, (Calibration Manager)  
MR. SUTHEE CHUMNAN, (Quality Manager)  
MR. BUNDEE SUWANNARAT, (Technical Manager)

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



PSE-CAL

c100819



CERTIFICATE No. : T23-1652

CSR No. : 230559

Page : 2 of 4

Equipment : Water Bath  
Manufacturer : Memmert  
Model : WNB 22  
Serial No. : L519.1143  
ID. No. :  
Date of Received : 17-May-2023  
Date of Calibration : 17-May-2023

### REFERENCE STANDARD INSTRUMENT :

Instrument	Type	Model	Serial No.	Cert. No.	Due Date	Traceability
Digital Thermometer with Sensor		54970 A	MY 44042652	DUTOWW/0722	23-07-2023	PSE

### CALIBRATION METHOD :

In house method : CA-W1.11.161 based on ASTM F715 : 1980 (re approved 2016)

### TRACEABILITY :

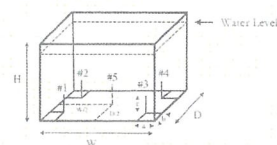
This Calibration Certificate is traceable to national standards which realize the unit of measurement according to the International System of Unit (SI) through :

PSE : Premier System Engineering Co., Ltd. (NSC-TISI-TIS 17025 CALIBRATION 0024)

### CALIBRATION RESULTS :

( / ) Without Adjustment ( ) After Adjustment

#### Sensor Installation Diagram



Dimension of the chamber : W x H x D = 35 x 29 x 22 cm  
Sensor Installation : a x b x c = 5 x 5 x 5 cm

The uncertainties are for a confidence probability of approximately 95 %.  
The above results are valid exclusively for calibration sample as mentioned in the report.  
This result of calibration was found accurate as shown on date and place of calibration only.

COPY

c100819



CERTIFICATE NO. : T23-1652

CSR No. : 230559

Page : 3 of 4

Equipment : Water Bath  
Manufacturer : Memmert  
Model : WNB 22  
Serial No. : L519.1143  
ID. No. :  
Date of Received : 17-May-2023  
Date of Calibration : 17-May-2023

### CALIBRATION RESULTS : ( Cont. )

( / ) Without Adjustment ( ) After Adjustment

#### Temperature Measurement Accuracy Test

The measurement results of the water bath and accessories are reported in the manner as shown below

Cal Point (°C)	Measured Standard Temperature (°C) at Spread Locations					Uncertainty ( ± °C )
	#1	#2	#3	#4	#5	
95.0	94.88	94.91	94.82	94.87	94.89	± 0.10

#### Water Bath Performance Results

The performance of the water bath are reported as shown below

Cal Point (°C)	UUC Setting (°C)	UUC Resetting (°C)	Water Bath Stability ( ± °C )	Water Bath Uniformity ( ± °C )	Overall Variation ( ± °C )
95.0	95.0	95.0	± 0.05	± 0.12	± 0.18

UUC : Unit Under Calibration

The uncertainty is not combine uniformity of the water bath

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

The above results are valid exclusively for calibration sample as mentioned in the report.

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

COPY

c100819

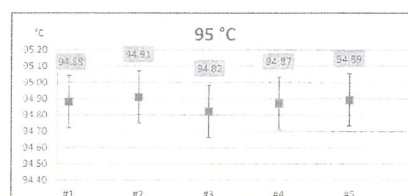


CERTIFICATE NO. : T23-1652

CSR No. : 230559

Page : 4 of 4

### Report Graph



The above results are valid exclusively for calibration sample as mentioned in the report.

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

- T. P. -

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## CALIBRATION CERTIFICATE

CERTIFICATE No. : M23-0763

CSR No. : 230559

Page : 1 of 3

Customer : Southern Thai Consulting Co., Ltd.  
59/45 Moo5 Srisoontorn, Talang, Phuket  
83110

Equipment : Analytical Balance  
Manufacturer : SATORUS  
Model : PCA2241 IS  
Serial No. : 0035506504  
ID. No. :  
Capacity : 220 g  
Resolution : 0.0001 g  
Instrument Condition : Good Condition  
Location of Calibration : Customer Laboratory  
Ambient Temperature : (30 ± 10) °C  
Relative Humidity : (50 ± 20) %  
Barometric Pressure : (1010 ± 10) hPa  
Date of Received : 17-May-2023  
Date of Calibration : 17-May-2023  
Date of Issued : 20-May-2023

APPROVED BY :

APPROVED SIGNATORY  
/ MR. JAYARONG RATTANAKORN / Calibration Manager  
/ MR. DR. THASACHARIN N. Chaitan Manager  
/ DR. BUNYOT J. KONGWROAT / Technical Manager

Calibrated By : Mr. Hattarat Kitchanong  
/ Calibration Technician

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



4010420



CERTIFICATE No. : M23-0763

CSR No. : 230559

Page : 2 of 3

Equipment : Analytical Balance  
Manufacturer : SATORUS  
Model : PCA2241 IS  
Serial No. : 0035506504  
ID. No. :  
Date of Received : 17-May-2023  
Date of Calibration : 17-May-2023

### REFERENCE STANDARD INSTRUMENT :

Instrument Type	Nominal Value	Serial No.	Cert. No.	Due Date	Traceability
Standard Weight Set	1 mg ~ 500 g		C02222319	05-11-2023	DKSH

### CALIBRATION METHOD :

In house method: CAL-WI-58 based on ISO/IEC 17025

### TRACEABILITY :

This Calibration Certificate is traceable to national standards which realize the unit of measurement according to the International System of Unit (SI) through :  
DKSH : DKSH Technology Limited (NSC/TSI-TIS 17025 CALIBRATION 0087)

### CALIBRATION RESULTS :

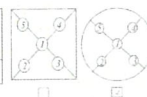
( / ) Without Adjustment ( / ) After Adjustment

### DETERMINATION OF THE STANDARD DEVIATION OF WEIGHT MACHINE (N=19)

Nominal Value (g)	Standard Deviation (g)
200	0.0000

### EFFECT OF OFF-CENTER LOADING AT 100 g

Position					Maximum Difference (g)
1	2	3	4	5	
10.0000	100.0000	100.0000	10.0000	100.0000	0.0000



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



4010420



CERTIFICATE No. : M23-0763

CSR No. : 230559

Page : 3 of 3

Equipment : Analytical Balance  
Manufacturer : SATORUS  
Model : PCA2241 IS  
Serial No. : 0035506504  
ID. No. :  
Date of Received : 17-May-2023  
Date of Calibration : 17-May-2023

### CALIBRATION RESULTS (Cont.)

( / ) Without Adjustment ( / ) After Adjustment

### EFFECT OF TARE AT 100 g

Nominal Value (g)	UUC* Reading (g)	Correction (g)
20	20.0000	0.0000
30	30.0000	0.0000
40	40.0000	0.0000
50	50.0000	0.0000
60	60.0000	0.0000
70	70.0000	0.0000
80	80.0000	0.0000
90	90.0000	0.0000
100	100.0000	0.0000

### ERROR OF INDICATION FROM NOMINAL VALUE

Nominal Value (g)	UUC* Reading (g)	Correction (g)	Uncertainty (±g)	Coverage Factor (k)
0.1	0.1000	0.0000	0.0000	2.00
0.2	0.2000	0.0000	0.0000	2.00
0.5	0.5000	0.0000	0.0000	2.00
1	1.0000	0.0000	0.0000	2.00
2	2.0000	0.0000	0.0000	2.00
5	5.0000	0.0000	0.0000	2.00
10	10.0000	0.0000	0.0000	2.00
20	20.0000	0.0000	0.0000	2.00
30	30.0000	0.0000	0.0000	2.00
40	40.0000	0.0000	0.0000	2.00
50	50.0000	0.0000	0.0000	2.00
60	60.0000	0.0000	0.0000	2.00
70	70.0000	0.0000	0.0000	2.00
80	80.0000	0.0000	0.0000	2.00
90	90.0000	0.0000	0.0000	2.00
100	100.0000	0.0000	0.0000	2.00
120	120.0000	0.0000	0.0000	2.00
140	140.0000	0.0000	0.0000	2.00
160	160.0000	0.0000	0.0000	2.00
180	180.0000	0.0000	0.0000	2.00
200	200.0000	0.0000	0.0000	2.00

UUC : Upper Under Calibration

The table as per (\*) marked are not NSC/ONSC accreditation scope.

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

The above results are valid exclusively for calibration sample as mentioned in the report

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

End



4010420



## Certificate of Calibration



Equipment: pH METER  
Model: Lab 845  
Serial No. (or ID.): 21021943  
Manufacturer: SI Analytics  
Electrode Serial No.: C211241005  
Condition: New

Certificate No.: C07230322  
Issued Date: 5 July 2023  
Job No.: KSPR2310509  
Page: 1 of 3  
Model: TopLine 29 pH Brand: SI Analytics

Customer: SOUTHERN THAI CONSULTING CO.,LTD.  
59/45 Moo 5 T.Srisoontorn,  
A. Talang, Phuket 83110

Environment Condition: Temperature 23 °C ± 2 °C  
Humidity 50 %RH ± 15 %RH

Calibration Place: Environment Laboratory, DKSH Technology Limited,  
2533 Sukhumvit Road, Bangkok,  
Phrakhanong, Bangkok 10260 Thailand

Calibration By: Mr.Atchai Ngamchanat

Calibration Date: 4 July 2023

The Method used: In house method, CAL-WI-58, base on ASTM E 70-07

Traceability: This certificate is traceable to SI Units, Sample Test is assured through primary measurement method Harmed cell, through CPAchem Ltd. (ISO/IEC 17034) Certificate No. 873613, 873615, 873614 And pH Scale traceable to the SI Units maintained by National Institute of Metrology (NIMT), Thailand through Industrial Foundation Electrical and Electronics Institute Certificate No. CA20220477EA

(Mr. Atchai Ngamchanat)  
Person in charge

(Mr. Nitinun Srihawan)  
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. This report shall not be reproduced except in full without approval of DKSH Technology Limited.



Unit: Sukhumvit Road 2533  
DKSH Technology Limited  
2533 Sukhumvit Road, Bangkok, Phrakhanong, Bangkok 10260  
Phone: +66 2539 7500 Email: info.calibration@dksh.com Website: www.dksh.com/en/india-thailand

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CAL-FM-C07-13: 12 Sep 2022



Calibration Results:

pH Scale

Input	pH Meter Reading			Uncertainty of Measurement (mV)	Coverage Factor (k)
	(mV)	Error (mV)	(pH)		
414.12	415	0.88	0.00	0.58	2.00
354.96	356	1.04	1.00	0.58	2.00
295.8	296	0.20	2.00	0.58	2.00
236.64	237	0.36	3.00	0.58	2.00
177.48	178	0.52	4.00	0.58	2.00
118.32	119	0.68	5.00	0.58	2.00
59.16	60	0.84	6.00	0.58	2.00
0	1	1.00	7.00	0.58	2.00
-59.16	-59	0.16	8.00	0.58	2.00
-118.32	-118	0.32	9.00	0.58	2.00
-177.48	-177	0.48	10.00	0.58	2.00
-236.64	-236	0.64	11.00	0.58	2.00
-295.8	-296	-0.20	12.00	0.58	2.00
-354.96	-355	-0.04	13.00	0.58	2.00
-414.12	-414	0.12	14.00	0.58	2.00

ใบตรวจสอบสภาพเครื่องวัดสิ่งแวดล้อม

เลขที่ใบงาน: KSPR2310509

ชนิดเครื่องมือ: pH METER

รุ่น: Lab 845

หมายเลขเครื่อง: 21021943

ตรวจสอบ (รับ)		รายการตรวจสอบ	ตรวจสอบ (ส่ง)		หมายเหตุ
04 Jul 2023			04 Jul 2023		
ปกติ	ไม่ปกติ		ปกติ	ไม่ปกติ	
		General			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. ความสมบูรณ์เครื่อง	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. ความสะอาด (ช่องใส่ตัวอย่าง, ภายใน-นอกเครื่อง)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. สวิตช์ ปิด - เปิด เครื่อง (On-Off Switch)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. ปุ่มกด (Keypad)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. หน้าจอ (Display, Screen Contrast)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		Spectrophotometer			
<input type="checkbox"/>	<input type="checkbox"/>	6. แบตเตอรี่สำรอง (Battery Backup) >= 2.5 VDC	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	7. ควบคุมเลือกความยาวคลื่น (Wavelength Control)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	8. ความยาวคลื่น (Wavelength Check)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	9. แสงยูวีเกินแสง (UV < 3,000 hour)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	10. แสงที่มองเห็นแสง (Visible < 5,000 hour)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	11. ช่องวัดหลายตัวอย่าง (Carousel Module)	<input type="checkbox"/>	<input type="checkbox"/>	
		pH Meter and Conductivity Meter			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	12. อิเล็กโทรด (Electrode and Connection Cable)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	13. ระดับสารละลายใน Electrode (Level KCl)	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	14. ฝาปิดกันปลาย Electrode (Dust Protection Hood)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	15. ขาตั้งอิเล็กโทรด (Stand)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		Turbidimeter			
<input type="checkbox"/>	<input type="checkbox"/>	16. ค่าความขุ่นต่ำสุด (No Sample)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	17. ระดับการส่องสว่างของแสง (>= 2.5 ไม่น้อย 3.0)	<input type="checkbox"/>	<input type="checkbox"/>	
		Automatic Dilutor			
<input type="checkbox"/>	<input type="checkbox"/>	18. สฟาท Piston Burettes	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	19. Function Rinsing and Dosing	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	20. ระบบท่อสายยางและอุปกรณ์ประกอบ	<input type="checkbox"/>	<input type="checkbox"/>	

เงื่อนไขข้อแนะนำ: Electrode วัดอุณหภูมิได้ 24.9°C โดย Control Waterbath ที่ 25.0 ±0.1°C

Mr. Atachai Ngamchanat  
Service Engineer

Electrode Test Results\*

The three-point calibration using three standard buffer solutions; pH 4.008, pH 6.986 and pH 10.010  
- During calibration, display of pH meter can be adjust to reading; pH 4.01, pH 6.99 and pH 10.01  
The practical slope of the pH electrode; 57.50 (mV/pH), 97.19%  
The zero point of the pH electrode; 7.17 (pH)

Sample Test Results

Standard Buffer Solution (pH)	Unit Under Calibration (pH)	Difference (pH)	Uncertainty of Measurement (pH)	Coverage Factor (k)
4.008	4.01	0.002	0.0084	2.04
6.986	6.99	0.004	0.0097	2.00
10.010	10.01	0.000	0.0085	2.03

\* Calibration Marked "Not TISI Accredited" in this Certificate have been included for completeness.

The End of Certificate

Certificate of Calibration

Number of Pages: 1 of 3

Certificate No. BSCC-UV-437/23  
Equipment UV-Vis Spectrophotometer  
Model UV-1800  
Manufacturer SHIMADZU  
Serial No. A1163505233CD  
ID No. UV-03  
Date of receipt 6 November 2023  
Date of calibration 6 November 2023  
Date of issue 10 November 2023

Customer name Southern Thai Consulting Co., Ltd.  
Address 55/45 Moo 5, Srisomnong, Talang, Phuket 83110

Temperature (25 ± 0.2) °C (On site)  
Humidity (60 ± 6.1) %RH (On site)

Equipment condition Good Operation

Calibration Location Laboratory

Calibration Procedure In-house method: WI-UV-702-01 based on ASTM E275-01

Traceability Wavelength Accuracy is traceable to certificate No. 99394 and 99395  
Photometric Accuracy is traceable to certificate No. 99380 and 99387  
Stray Light is traceable to certificate No. 99385  
The above certificate is traceable to SI unit through Stama Scientific Ltd  
(UKAS accredited calibration laboratory NO. 0659)

Calibrated by Mr. Sarunkorn Pukachong

Approved by

Mr. Kanchit Choothep  
Technical Manager

The above results are valid exclusively for the calibrated items as mention in this report / certificate  
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Bara Scientific Co., Ltd.  
968 U Chu Liang Building Floor 7 Rama4 Road  
Siam Bangkok Bangkok Thailand 10500  
Tel : 02-6324300 Fax : 02-6375496-7  
www.barscientific.com



## Certificate of Calibration

Certificate No. BSCC-UV-437/23

Number of Page(s)

2 of 3

### Calibration Results:

#### 1. Wavelength Accuracy

Certified Wavelength (nm)	UUC (nm)	Error (nm)	Uncertainty (±nm)
360.89	360.79	-0.10	0.18
418.53	418.50	-0.03	0.18
513.39	513.40	0.01	0.18
572.99	573.10	0.11	0.18
879.41	879.40	-0.01	0.18

#### 2. Photometric Accuracy (UV)

Wavelength (nm)	Certified Absorbance (A)	UUC (A)	Error (A)	Uncertainty (±A)
235	CNR	CNR	CNR	CNR
257	0.0000	0.0000	0.0000	0.0075
	0.8579	0.8547	-0.0032	0.0075
313	CNR	CNR	CNR	CNR
350	0.0000	0.0000	0.0000	0.0075
	0.6378	0.6362	-0.0014	0.0075

\*CNR = Customer not request

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FM-UV-708-02 Rev 01 (23/01/83)



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## Certificate of Calibration

Certificate No. BSCC-UV-437/23

Number of Page(s)

3 of 3

### Calibration Results:

#### 3. Photometric Accuracy (Visible)

Wavelength (nm)	Certified Absorbance (A)	UUC (A)	Error (A)	Uncertainty (±A)
420.0	CNR	CNR	CNR	CNR
	CNR	CNR	CNR	CNR
	CNR	CNR	CNR	CNR
440.0	CNR	CNR	CNR	CNR
	CNR	CNR	CNR	CNR
	CNR	CNR	CNR	CNR
465.0	0.0000	0.0000	0.0000	0.0042
	0.4894	0.4891	-0.0003	0.0042
	0.6788	0.6795	-0.0003	0.0042
	0.9091	0.9081	-0.0010	0.0042
546.1	0.0000	0.0000	0.0000	0.0042
	0.5042	0.5026	-0.0016	0.0042
	0.6899	0.6882	-0.0017	0.0042
	0.9822	0.9801	-0.0021	0.0042
590.0	CNR	CNR	CNR	CNR
	CNR	CNR	CNR	CNR
	CNR	CNR	CNR	CNR
635.0	0.0000	0.0000	0.0000	0.0042
	0.5181	0.5163	-0.0018	0.0042
	0.6878	0.6860	-0.0018	0.0042
	0.9751	0.9725	-0.0026	0.0042

\*CNR = Customer not request

#### 4. Stray Light\*

Standard cut-off wavelength (nm)	Wavelength (nm)	Transmission (%)	Absorbance (A)
200 98±0.11nm	201.00	0.9400	2.0269

The Stray light transmission reference is less than 1.0%T and Stray light absorbance reference is greater than 2.00A

\*Stray Light not NSC-ONSC Accredited.

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

\*\*\*End of Certificate\*\*\*

The above results are valid exclusively for the calibrated item(s) as mention in this report / certificate. Advertising the report / Certificate and publicity of the results are prohibited and also shall not be reproduced except in full, without written approval of the Bara Scientific Co., Ltd.

FM-UV-708-02 Rev 01 (23/01/83)



PREMIER SYSTEM ENGINEERING CO., LTD.  
123 Moo 8 Kanjanavanit Rd., Banpru, Hatyai, Songkhla 90250

E-mail : pse-cal@sriranggroup.com , Fax : (074)223912 Tel : 084-2148162, 084-2141665, 074-223906-9



## CALIBRATION CERTIFICATE

CERTIFICATE No. : T23-3234

CSR No. : 231381

Page : 1 of 4

Customer : Southern Thai Consulting Co., Ltd.  
59/45 Moo5 Sissomontorn, Talang, Phuket  
83110

Equipment : Refrigerator  
Manufacturer : Senden Intercool  
Model : SEA-0405  
Serial No. : SEA0405-191200194  
ID. No. :  
Resolution : 0.1 °C  
Instrument Condition : Good Condition  
Location of Calibration : Customer Laboratory  
Ambient Temperature : (30 ± 15) °C  
Relative Humidity : (60 ± 20) %  
Date of Received : 16-Nov-2023  
Date of Calibration : 16-Nov-2023  
Date of Issued : 20-Nov-2023

APPROVED BY :

Calibrated By : Mr. Athawat Supachewea  
(Temperature Supervisor)

APPROVED SIGNATORY  
( ) MR. PIRAPONG RAFFANAKAN / Calibration Manager  
( ) MR. MEYRA CHUATRUN / Quality Manager  
( ) MR. BUNTOT SUWANNARAT / Technical Manager

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



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CERTIFICATE No. : T23-3234

CSR No. : 231381

Page : 2 of 4

Equipment : Refrigerator  
Manufacturer : Senden Intercool  
Model : SEA-0405  
Serial No. : SEA0405-191200194  
ID. No. :  
Date of Received : 16-Nov-2023  
Date of Calibration : 16-Nov-2023

### REFERENCE STANDARD INSTRUMENT :

Instrument Type	Model	Serial No.	Cert. No.	Due Date	Traceability
Digital Thermometer with Sensor	34970-A	MY 44042642	DAT003/3823	01-08-2024	PSE

### CALIBRATION METHOD :

In-house method : CA.W1.11.160 based on ASTM E145 - 1994 (re-approved 2011)

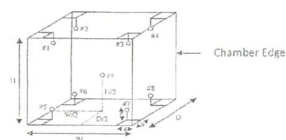
### TRACEABILITY :

This Calibration Certificate is traceable to national standards which realize the unit of measurement according to the International System of Unit (SI) through :

PSE : Premier System Engineering Co., Ltd. (NSC-TIS-TIS 17025 CALIBRATION 0024)

### CALIBRATION RESULTS :

Sensor Installation Diagram



Dimension of the chamber : W x H x D = 55 x 164 x 43 cm  
Sensor Installation : a x b x c = 5 x 5 x 5 cm

The uncertainties are for a confidence probability of approximately 95 %.  
The above results are valid exclusively for calibration sample as mentioned in the report.  
This result of calibration was found accurate as shown on date and place of calibration only.

4080723



CERTIFICATE NO. : T23-3234

CSR No. : 231381

Page : 3 of 4

Equipment : Refrigerator  
Manufacturer : Sengen Intercool  
Model : SEA-0403  
Serial No. : SRA003-191200194  
ID. No. : -  
Date of Received : 16-Nov-2023  
Date of Calibration : 16-Nov-2023

## CALIBRATION RESULTS : (Cont.)

( / ) Without Adjustment

( ) After Adjustment

## Temperature Measurement Accuracy Test:

The measurement results of the refrigerator and associates are reported in the manner as shown below

Cal Point	Measured Standard Temperature (°C) at Spread Locations									Uncertainty
(°C)	#1	#2	#3	#4	#5	#6	#7	#8	Ref. 9	(± °C)
4	4.78	4.58	4.20	4.01	4.57	4.79	4.37	4.25	4.23	1.2

## Refrigerator Performance Result

The performance of the refrigerator are reported as shown below

Cal Point	UUC Setting	UUC Reading	Chamber Stability	Chamber Uniformity	Overall Variation
(°C)	(°C)	(°C)	(± °C)	(± °C)	(± °C)
4	4.0	4.0	0.97	1.35	2.48

UUC : Unit Under Calibration

The uncertainties are for a confidence probability of approximately 95 %.  
The above results are valid exclusively for calibration sample as mentioned in the report.  
This result of calibration was found accurate as shown on date and place of calibration only.

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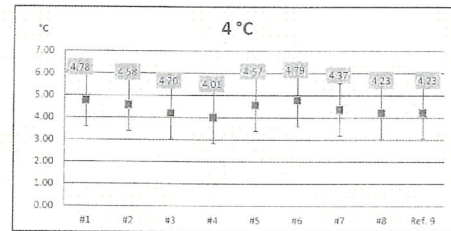


CERTIFICATE NO. : T23-3234

CSR No. : 231381

Page : 4 of 4

## Report Graph



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The above results are valid exclusively for calibration sample as mentioned in the report.  
This result of calibration was found accurate as shown on date and place of calibration only.

-- End --



PREMIER SYSTEM ENGINEERING CO., LTD.

123 Moo 8 Kanjanavanit Rd., Banpui, Hatyai, Songkhla 90250

E-mail : pse-cal@sriranggroup.com, Fax. : (074)222912 Tel. : 084-2148162, 084-2148165, 074-222900-9



## CALIBRATION CERTIFICATE

CERTIFICATE No. : T23-3236

CSR No. : 231381

Page : 1 of 4

Customer : Southern Thai Consulting Co., Ltd.  
59/45 Moo5 Srisootorn, Talang, Phukret  
83110

Equipment : Incubator  
Manufacturer : ACCUPLUS  
Model : EC8500  
Serial No. : 0408-0413-0034  
ID. No. : -  
Resolution : 0.1 °C  
Instrument Condition : Good Condition  
Location of Calibration : Customer Laboratory  
Ambient Temperature : (30 ± 15) °C  
Relative Humidity : (60 ± 20) %  
Date of Received : 16-Nov-2023  
Date of Calibration : 16-Nov-2023  
Date of Issued : 20-Nov-2023

COPY

APPROVED BY :

Calibrated By : Mr. Arthwat Supacheewa  
(Temperature Supervisor)

APPROVED SIGNATORY  
( ) MR. PIVAPONG RAITANAKUL : Calibration Manager  
( ) MR. METHA : CHAIRMAN / Quality Manager  
( ) MR. BUNPOT SUWAKHARAT : Technical Manager

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



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d080723



CERTIFICATE No. : T23-3236

CSR No. : 231381

Page : 2 of 4

Equipment : Incubator  
Manufacturer : ACCUPLUS  
Model : EC8500  
Serial No. : 0408-0413-0034  
ID. No. : -  
Date of Received : 16-Nov-2023  
Date of Calibration : 16-Nov-2023

## REFERENCE STANDARD INSTRUMENT :

Instrument	Type	Model	Serial No.	Cert. No.	Due Date	Traceability
Digital Thermometer with Sensor		34970 A	MY 110242662	DA17003/0823	01-08-2024	PSE

## CALIBRATION METHOD :

In house method : CA 90111.185 based on ASTM E145 : 1994 (re-approved 2011)

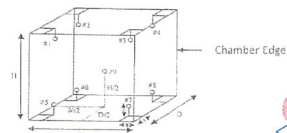
## TRACEABILITY :

This Calibration Certificate is traceable to national standards which realize the unit of measurement according to the International System of Unit (SI) through :

PSE : Premier System Engineering Co., Ltd. (NSC TISI TIS 17025 CALIBRATION 0026)

## CALIBRATION RESULTS :

## Sensor Installation Diagram



COPY

Dimension of the chamber : W x H x D = 56 x 168 x 60 cm  
Sensor Installation : a x b x c = 5 x 5 x 5 cm

The uncertainties are for a confidence probability of approximately 95 %.  
The above results are valid exclusively for calibration sample as mentioned in the report.  
This result of calibration was found accurate as shown on date and place of calibration only.

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CERTIFICATE NO. : T23-3236

CSR No. : 231381

Page : 3 of 4

Equipment : Incubator  
Manufacture : ACCUFILUS  
Model : EC8500  
Serial No. : 0408-0415-0034  
ID. No. : -  
Date of Received : 16-Nov-2023  
Date of Calibration : 16-Nov-2023

## CALIBRATION RESULTS : (Cont.)

( / ) Without Adjustment

( ) After Adjustment

## Temperature Measurement Accuracy Test

The measurement results of the incubator and associates are reported in the manner as shown below

Cal Point	Measured Standard Temperature (°C) at Spread Locations									Uncertainty
(°C)	#1	#2	#3	#4	#5	#6	#7	#8	Ref. 9	(± °C)
20	20.27	20.22	20.28	20.25	20.10	20.24	20.14	19.95	20.20	0.71

## Incubator Performance Result

The performance of the incubator are reported as shown below

Cal Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Chamber Stability (± °C)	Chamber Uniformity (± °C)	Overall Variation (± °C)
20	20.6	20.0	0.16	0.37	0.58

UUC : Unit Under Calibration

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

The above results are valid exclusively for calibration sample as mentioned in the report.

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

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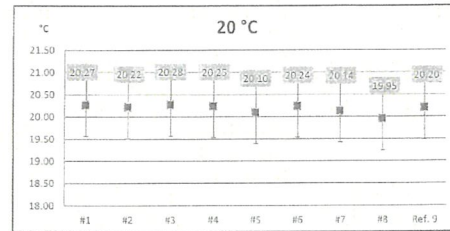


CERTIFICATE NO. : T23-3236

CSR No. : 231381

Page : 4 of 4

## Report Graph



COPY

The above results are valid exclusively for calibration sample as mentioned in the report.

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

- End -



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E-mail : pse-cal@srirangroup.com, Fax. : (074)222912 Tel. : 084-2148162, 084-2148165, 074-222906-9



## CALIBRATION CERTIFICATE

CERTIFICATE No. : T23-3490

CSR No. : 231425

Page : 1 of 2

Customer : Southern Thai Consulting Co., Ltd.  
59/45 Moo5 Srisoontorn, Talang, Phuket  
83110

Equipment : Liquid in Glass Thermometer  
Manufacture : PRECISION  
Model : -  
Serial No. : 5319  
ID. No. : -  
Range : -10 ~ 420 °C  
Resolution : 1 °C  
Instrument Condition : Good Condition  
Location of Calibration : PSE Laboratory  
Ambient Temperature : (25 ± 3) °C  
Relative Humidity : (35 ± 15) %  
Received Date : 20-Nov-2023  
Calibration Date : 24-Nov-2023  
Date of Issue : 27-Nov-2023

Calibrated By : Mr Arthwat Supascheewa  
(Temperature Supervisor)

APPROVED BY :

APPROVED SIGNATORY  
/ MR. PIYAPONG RATTANAKAN / Calibration Manager  
/ MR. METIJA CHUABUN / Quality Manager  
/ MR. SUNGNOT SUWONNARAT / Technical Manager

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



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CERTIFICATE No. : T23-3490

CSR No. : 231425

Page : 2 of 2

Equipment : Liquid in Glass Thermometer  
Manufacture : PRECISION  
Model : -  
Serial No. : 5319  
ID. No. : -  
Received Date : 20-Nov-2023  
Calibration Date : 24-Nov-2023

## REFERENCE STANDARD INSTRUMENT :

Instrument	Type	Model	Serial No.	Cert. No.	Due Date	Traceability
Digital Thermometer With Sensor		1529	B17472	231257	02-03-2024	TPA

## CALIBRATION METHOD :

In house method : CA/SL11 043 (ASTM E77-14)

## TRACEABILITY :

This Calibration Certificate is traceable to national standards which realize the unit of measurement according to the International System of Unit (SI) through:

TPA : Technology Promotion Association (Thailand-Japan), (NSC-TISI-TIS 17035 CALIBRATION 0608)

## CALIBRATION RESULTS :

( / ) Without Adjustment

( ) After Adjustment

Immersion : Total

Type of Liquid : Alcohol

Ice Point Reading : -1.59 °C

Cal Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Correction (°C)	Uncertainty (± °C)
4	5.202	4.0	1.202	0.58
25	26.042	25.0	1.042	0.58

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Readability of UUC : 0.5 °C

UUC\* : Unit Under Calibration

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

The above results are valid exclusively for calibration sample as mentioned in the report.

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

- End -

4089723





PREMIER SYSTEM ENGINEERING CO., LTD.  
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E-mail : pse-cal@airtrngroup.com, Fax : (074)222912 Tel : 084-2148162, 084-2148165, 074-222900-9



## CALIBRATION CERTIFICATE

CERTIFICATE No. : M23-1727

CSR No. : 231381

Page : 1 of 3

Customer : Southern Thai Consulting Co., Ltd.  
59/45 Moo5 Srisoontorn, Talang, Phuket  
83110

Equipment : Analytical Balance  
Manufacturer : SARTORIUS  
Model : PRACTUM224-1S  
Serial No. : 0035106544  
ID. No. : -  
Capacity : 220 g  
Resolution : 0.0001 g  
Instrument Condition : Good Condition  
Location of Calibration : Customer Laboratory  
Ambient Temperature : (30 ± 10) °C  
Relative Humidity : (50 ± 20) %  
Barometric Pressure : (1010 ± 10) hPa  
Date of Received : 16-Nov-2023  
Date of Calibration : 16-Nov-2023  
Date of Issued : 20-Nov-2023

APPROVED BY :

APPROVED SIGNATORY  
/ MR. TATANG RATTANAKAN / Calibration Manager  
/ MR. METHA CHAIBUN / Quality Manager  
/ MR. SUNPOT SUTANANARAT / Technical Manager

Calibrated By : Mr. Piyapol Rongsiwat  
( Calibration Technician )

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CERTIFICATE No. : M23-1727

CSR No. : 231381

Page : 2 of 3

Equipment : Analytical Balance  
Manufacturer : SARTORIUS  
Model : PRACTUM224-1S  
Serial No. : 0035106544  
ID. No. : -  
Date of Received : 16-Nov-2023  
Date of Calibration : 16-Nov-2023

### REFERENCE STANDARD INSTRUMENT :

Instrument Type	Nominal Value	Serial No.	Cert. No.	Due Date	Traceability
Standard Weight Set	100 mg ~ 500g	-	C02230001,2	03-01-2024	DKSH

### CALIBRATION METHOD :

In-house method : CA-WI11.015 based on UKAS LAB 14 : 2019

### TRACEABILITY :

This Calibration Certificate is traceable to national standards which realize the unit of measurement according to the International System of Unit (SI) through :  
DKSH : DKSH Technology Limited (NSC-TISI-TIS 17023 CALIBRATION 0037)

### CALIBRATION RESULTS :

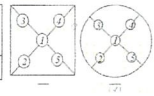
( / ) Without Adjustment ( ) After Adjustment

### DETERMINATION OF THE STANDARD DEVIATION OF WEIGHT MACHINE (N=10)

Nominal Value (g)	Standard Deviation (g)
100	0.00008

### EFFECT OF OFF CENTER LOADING AT 100 g

Position					Maximum Difference (g)
1	2	3	4	5	
100.0080	100.0001	100.0001	100.0001	99.9999	0.0081



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

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CERTIFICATE No. : M23-1727

CSR No. : 231381

Page : 3 of 3

Equipment : Analytical Balance  
Manufacturer : SARTORIUS  
Model : PRACTUM224-1S  
Serial No. : 0035106544  
ID. No. : -  
Date of Received : 16-Nov-2023  
Date of Calibration : 16-Nov-2023

### CALIBRATION RESULTS : ( Cont. )

( / ) Without Adjustment ( ) After Adjustment

### EFFECT OF TARE AT 100 g

Nominal Value (g)	UUC* Reading (g)	Correction (g)
20	20.0000	-0.00032
40	40.0000	-0.00035
60	60.0000	-0.00030
80	79.9999	-0.00020
100	99.9998	-0.00018

### ERROR OF INDICATION FROM NOMINAL VALUE

Nominal Value (g)	UUC* Reading (g)	Correction (g)	Uncertainty (±g)	Coverage Factor (k)
* Unless	0.0000	0.00000	0.00020	2.20
0.01	0.0100	0.00000	0.00020	2.20
0.05	0.0500	0.00000	0.00020	2.20
0.1	0.1000	0.00000	0.00020	2.20
0.5	0.5000	0.00000	0.00020	2.20
1	1.0000	-0.00001	0.00020	2.20
2	2.0000	-0.00002	0.00020	2.20
5	5.0000	-0.00002	0.00020	2.20
10	10.0000	0.00001	0.00020	2.18
20	20.0000	0.00002	0.00020	2.18
40	40.0000	0.00003	0.00020	2.14
60	60.0000	0.00000	0.00021	2.12
80	79.9999	0.00009	0.00023	2.08
100	100.0000	0.00002	0.00023	2.08
120	120.0000	-0.00003	0.00026	2.05
140	140.0000	0.00005	0.00027	2.04
160	160.0001	-0.00012	0.00028	2.03
180	180.0001	0.00014	0.00031	2.02
200	200.0000	0.00010	0.00032	2.02

UUC : Unit Under Calibration

The table as per (\*) marked are not NSC-ONSC accreditation scope

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

The above results are valid exclusively for calibration sample as mentioned in the report

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

End



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## CALIBRATION CERTIFICATE

CERTIFICATE No. : V23-1972

CSR No. : 231381

Page : 1 of 2

Customer : Southern Thai Consulting Co., Ltd.  
59/45 Moo5 Srisoontorn, Talang, Phuket  
83110

Equipment : Conductivity  
Manufacturer : APERA  
Model : EC 8500  
Serial No. : ECS5001323271005  
ID. No. : -  
Resolution : 0.1uS/cm, 1uS/cm, 0.0mS/cm  
Instrument Condition : Good Condition  
Location of Calibration : Customer Laboratory  
Ambient Temperature : (25 ± 3) °C  
Relative Humidity : (55 ± 15) %  
Date of Received : 16-Nov-2023  
Date of Calibration : 16-Nov-2023  
Date of Issued : 20-Nov-2023

APPROVED BY :

Calibrated By : Mr. Alongkorn Chewasarakul  
( Calibration Technician )

APPROVED SIGNATORY  
/ MR. TATANG RATTANAKAN / Calibration Manager  
/ MR. METHA CHAIBUN / Quality Manager  
/ MR. SUNPOT SUTANANARAT / Technical Manager



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

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CERTIFICATE NO. : Y23-092

CSR No. : 231381

Page : 2 of 2

Equipment : Conductivity  
Manufacturer : APERA  
Model : PC 8500  
Serial No. : EC85001323271005  
ID. No. : -  
Date of Received : 16-Nov-2023  
Date of Calibration : 16-Nov-2023

## REFERENCE STANDARD INSTRUMENT:

Instrument Type	Nominal Value/Model	Lot No.	Batch No.	Due Date	Traceability
Conductivity Standard	84 uS/cm	879340	879340	14-03-2024	CPA Chem
Conductivity Standard	1413.0 uS/cm	879342	879342	13-03-2024	CPA Chem
Conductivity Standard	12.88 mS/cm	879343	879343	14-03-2024	CPA Chem

## CALIBRATION METHOD:

In-house method CA-WT11181 based on direct measurement by using certified reference material (CRM).

## TRACEABILITY:

This Calibration Certificate is traceable to national standards which realize the unit of measurement according to the International System of Units (SI) through:  
CPA Chem : CPA Chem Ltd (ANAB Cert No. AB-1835)

## CALIBRATION RESULTS:

( / ) Without Adjustment

( ) After Adjustment

Function : Chemical Measurement

Standard Buffer Solutions (µS/cm)	UUC Reading (µS/cm)	Correction (µS/cm)	Uncertainty (±µS/cm)	Coverage Factor (k)
* 84.0	82.7	1.28	1.2	2.01
* 1413.0	1410	3.4	19	2.00

Standard Buffer Solutions (mS/cm)	UUC Reading (mS/cm)	Correction (mS/cm)	Uncertainty (± mS/cm)	Coverage Factor (k)
12.88	12.94	-0.06	0.18	2.00

UUC : Unit Under Calibration

The table as per (\*) marked are not NSC-ONSC accreditation scope.

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

The above results are valid exclusively for calibration sample as mentioned in the report.

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

End

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