

ภาคผนวก ค

ผลการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม

ภาคผนวก ค-1

คุณภาพอากาศจากแหล่งกำเนิด



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lao-Lok-Banthal Road, Nong-Lao-Lok, Banthal, Rayong Thailand 21120

P/O :
Project Name : Environment : EIA
Project Location :

Page 1 of 1

Sample Number	Sampled Date	Sample Description	Location	Date Analysis Commenced	Condition of Sample
25113022-1	Dec 23, 2025	Emission from Stationary Source	Stationary Source	Dec 24, 2025	Extracted into two 2-L collection flasks, one filter paper placed in plastic petri dish, one plastic bottle, one 10-L air sampling

Stack Description									
Analysis	Sampled Time	Unit	LOD	LOQ	Result	Method	Testing	Stack Description	
								Diameter	Height
Ambient Pressure	752	mmHg		0.50	m	Oxygen	3.5	%	
Ambient Temperature	31.2	°C		Circle		Carbon Dioxide	10.0	%	
Type of Process	Combustion			Stack Temperature	124	°C	Gas Velocity	3.6	m/s
Type of Fuel	Natural Gas			Moisture	10.08	%	Flow Rate (Actual O2)	1690	Nm ³ /hr

Air Testing				
Oxides of Nitrogen *	10:30 AM - 10:40 AM	ppm	1.06	20.1
				U.S. Environmental Protection Agency, EPA Method 7
Total Suspended Particulate	10:30 AM - 11:22 AM	mg/m3	0.5	320
				U.S. Environmental

Protection Agency 40
CFR method 5, Appendix
A, December 7, 2020

Guideline : Notification of the Ministry of Industry 2006 (B.E. 2549) Published in the Royal Government Gazette, Vol.123 Special Part 125 D, dated December 4, 2006 (B.E. 2549)

Sampling By : Sathaporn Thakornvutthiruangwong 1-313-a-0036

Guideline: Notification of the Ministry of Industry 2006 (B.E. 2549) Published in the Royal Government Gazette, Vol.123 Special Part 125 D, dated December 4, 2006 (B.E. 2549)

Samrolling By: Satharoon Thakraw Institution 3-323-a-0036

- LOD : Limit of Detection
- LOQ^{**} : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analytes(s) marked * are not included in scope of Accreditation ISO/IEC 17025.

Tharita K.

Approved by

Dej Changchon
Senior Manager
โทร: ๐๒-๖๓๕๔๗๘๙๑

ทะเบียนเลขที่ 7-323-ค-0001

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2272-62 EMAIL



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Lok-Bankhal Road, Nong-Lak-Lok, Bankhal, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

TESTING
No.0042

Lot ID: 25113023

Date Received : Dec 23, 2025

Date Reported : Jan 03, 2026

Report Number : 3473495-1C1

Sample Number : 25113023-1

Sampled Date : Dec 23, 2025

Sample Description : Emission from Stationary Source

Location : 11aavrsuu Polypropylene filter unit 1-4

Date Analysis Commenced : Dec 24, 2025

Condition of Sample :

Extracted into two 2-L collection flasks, one filter paper placed in plastic petri dish, one 10-L air sampling bag and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	752	mmHg	Diameter	0.50	m	Oxygen	3.0	%	Testing Location
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	10.2	%	
Type of Process	Combustion		Stack Temperature	128	°C	Gas Velocity	3.1	m/s	
Type of Fuel	Natural Gas		Moisture	10.39	%	Flow Rate (Actual O2)	1451	Nm3/hr	
Analyte	Sampled Time	Unit	LOQ (LOR)	Result at 7 %O ₂	Method	Guideline Limit			

Air Testing

Oxides of Nitrogen *

11:50 AM - 12:00 PM

ppm

1.06

20.9

<0.5

0.5

320

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

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U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

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U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

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U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Lok-Bankhal Road, Nong-Lak-Lok, Bankhal, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 2590215

Date Received : Sep 29, 2025

Date Reported : Oct 06, 2025

Report Number : 3414159-1

Sample Number : 2590215-1

Sampled Date : Sep 29, 2025

Sample Description : Emission from Stationary Source

Location : 11aavrsuu Polypropylene filter unit 1-4

Date Analysis Commenced : Sep 29, 2025

Condition of Sample :

Extracted into two amber plastic bottles, refrigerated

Stack Description

Ambient Pressure	748	mmHg	Diameter	0.80	m	Oxygen	20.9	%	Testing Location
Ambient Temperature	30.3	°C	Shape	Circle		Carbon Dioxide	0.0	%	
Type of Process	Process		Stack Temperature	38.0	°C	Gas Velocity	5.5	m/s	
Type of Fuel	-		Moisture	3.21	%	Flow Rate (Actual O2)	9097	Nm3/hr	
Analyte	Sampled Time	Unit	LOQ (LOR)	Result	Method	Guideline Limit			

Air Testing

Sulfuric acid

11:30 AM - 12:12 PM

ppm

0.01

<0.01

25

U.S. Environmental Protection Agency, EPA Method 8

U.S. Environmental Protection Agency, EPA Method 8

Rayong

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U.S. Environmental Protection Agency, EPA Method 8

U.S. Environmental Protection Agency, EPA Method 8

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U.S. Environmental Protection Agency, EPA Method 8

U.S. Environmental Protection Agency, EPA Method 8

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U.S. Environmental Protection Agency, EPA Method 8

U.S. Environmental Protection Agency, EPA Method 8

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U.S. Environmental Protection Agency, EPA Method 8

U.S. Environmental Protection Agency, EPA Method 8

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U.S. Environmental Protection Agency, EPA Method 8

U.S. Environmental Protection Agency, EPA Method 8



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Lok-Bankhal Road, Nong-Lak-Lok, Bankhal, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

TESTING
No.0042

Lot ID: 25113023

Date Received : Dec 23, 2025

Date Reported : Jan 03, 2026

Report Number : 3473495-1C1

Sample Number : 25113023-1

Sampled Date : Dec 23, 2025

Sample Description : Emission from Stationary Source

Location : 11aavrsuu Polypropylene filter unit 1-4

Date Analysis Commenced : Dec 24, 2025

Condition of Sample :

Extracted into two 2-L collection flasks, one filter paper placed in plastic petri dish, one 10-L air sampling bag and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	752	mmHg	Diameter	0.50	m	Oxygen	3.0	%	Testing Location
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	10.2	%	
Type of Process	Combustion		Stack Temperature	128	°C	Gas Velocity	3.1	m/s	
Type of Fuel	Natural Gas		Moisture	10.39	%	Flow Rate (Actual O2)	1451	Nm3/hr	
Analyte	Sampled Time	Unit	LOQ (LOR)	Result at 7 %O ₂	Method	Guideline Limit			

Air Testing

Oxides of Nitrogen *

11:50 AM - 12:00 PM

ppm

1.06

20.9

<0.5

0.5

320

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

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Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Lok-Bankhal Road, Nong-Lak-Lok, Bankhal, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

TESTING
No.0042

Lot ID: 25113023

Date Received : Dec 23, 2025

Date Reported : Jan 03, 2026

Report Number : 3473495-1C1

Sample Number : 25113023-1

Sampled Date : Dec 23, 2025

Sample Description : Emission from Stationary Source

Location : 11aavrsuu Polypropylene filter unit 1-4

Date Analysis Commenced : Dec 24, 2025

Condition of Sample :

Extracted into two 2-L collection flasks, one filter paper placed in plastic petri dish, one 10-L air sampling bag and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	752	mmHg	Diameter	0.50	m	Oxygen	3.0	%	Testing Location
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	10.2	%	
Type of Process	Combustion		Stack Temperature	128	°C	Gas Velocity	3.1	m/s	
Type of Fuel	Natural Gas		Moisture	10.39	%	Flow Rate (Actual O2)	1451	Nm3/hr	
Analyte	Sampled Time	Unit	LOQ (LOR)	Result at 7 %O ₂	Method	Guideline Limit			

Air Testing

Oxides of Nitrogen *

11:50 AM - 12:00 PM

ppm

1.06

20.9

<0.5

0.5

320

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

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U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

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U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

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Rayong

U.S. Environmental Protection Agency, EPA Method 7

U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)

Rayong

Rayong



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Lok-Bankhal Road, Nong-Lak-Lok, Bankhal, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

</



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
P/O : 129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120
Project Name : Environment : EIA
Project Location :
Lot ID: 2590215
Date Received : Sep 29, 2025
Date Reported : Oct 07, 2025
Report Number: 2414159-2

Page 1 of 1

Sample Number : 2590215-1
Sample Date : Sep 29, 2025
Sample Description : Emission from Stationary Source
Location : Ulaexsua Poly propylene filter size 1-4
Date Analysis Commenced : Sep 30, 2025
Condition of Sample : Extracted into two amber plastic bottles, refrigerated

Stack Description							
Ambient Pressure	748	mmHg	Diameter	0.80	m	Oxygen	20.9 %
Ambient Temperature	30.3	°C	Shape	Circle		Carbon Dioxide	0.0 %
Type of Process			Stack Temperature	38.0	°C	Gas Velocity	5.5 m/s
Type of Fuel			Moisture	3.21	%	Flow Rate (Actual O2)	9097 Nm3/hr

Analyte	Sampled Time	Unit	LOD (LOR)	Result	Method	Testing Location
Air Testing Phosphoric acid	11:30 AM - 12:00 PM	mg/m3	0.05	<0.05	U.S. Environmental Protection Agency, EPA Method 25	Bangkok

Sampling By : Suddamrong Chokpitiyan , Apisit Singha
Remark :
: LOD : Limit of Detection
: "<" : Lower than LOD (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by : *Orawan R.*
Orawan Rakyong
Scientist (3)

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ภาคผนวก ค-2

คุณภาพอากาศในบรรยากาศ



Analysis / Test Report

TESTING
No.0042

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lok-Bankhal Road, Nong-Lok, Bankhai, Rayong Thailand

21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025

Date Reported : Oct 21, 2025

Report Number : 3414167-1

Page 1 of 28

Sample Number	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
2590219-1	Sep 29, 2025	Air Quality							
Sample Description	Air Quality								
Location	พื้นที่อุตสาหกรรม (A1) (GPS 47P 0742960, 1419452)								
Date Analysis Commenced	Oct 09, 2025								
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated								
Barometric Pressure	756 mmHg								
Atmospheric Temperature	28.6 °C								
Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Phosphoric acid *	29/09/05 - 30/09/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Sulfuric acid *	29/09/05 - 30/09/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Total Suspended Particulate	29/09/25 - 30/09/25	mg/m3	-	0.002	0.017	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong	

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Supawit Suwanmarat

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This report shall not be reproduced except in full without the written approval of the laboratory.

Thanitak.

Approved by

Thanita Kulsumwong
Scientist (4)

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2025-02/ENAL



Analysis / Test Report

TESTING
No.0042

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lok-Bankhal Road, Nong-Lok, Bankhai, Rayong Thailand

21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025

Date Reported : Oct 21, 2025

Report Number : 3414167-1

Page 2 of 28

Sample Number	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
2590219-2	Sep 30, 2025	Air Quality							
Sample Description	Air Quality								
Location	พื้นที่อุตสาหกรรม (A1) (GPS 47P 0742960, 1419452)								
Date Analysis Commenced	Oct 09, 2025								
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated								
Barometric Pressure	756 mmHg								
Atmospheric Temperature	28.1 °C								
Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Phosphoric acid *	30/09/25 - 01/10/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Sulfuric acid *	30/09/25 - 01/10/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Total Suspended Particulate	30/09/25 - 01/10/25	mg/m3	-	0.002	0.018	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong	

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Supawit Suwanmarat

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

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Thanitak.

Approved by

Thanita Kulsumwong
Scientist (4)

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2025-02/ENAL



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025

Date Reported : Oct 21, 2025

Report Number : 3414167-1

TESTING
No. 0042

Page 3 of 26

Sample Number	2590219-3
Sample Date	Oct 01, 2025
Sample Description	Air Quality
Location	ถนนสุขุมวิทสายใหม่ (A1) (GPS 47P 0743960, 1419452)
Date Analysis Commenced	Oct 09, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	28.5 °C

Analyte	Sampled Date/Time	Unit	LOQ (LOR)	Result	Guideline Limit	Method	Testing Location
Air Testing							
Phosphoric acid *	01/10/25 - 02/10/25	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	01/10/25 - 02/10/25	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	01/10/25 - 02/10/25	mg/m ³	0.002	0.026	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sirapatt Suwanmarat

Remark :

- LOD : Limit of Detection
- <" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Thanitak.

Approved by

Thanita Kulsuriwong
Scientist (4)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025

Date Reported : Oct 21, 2025

Report Number : 3414167-1

TESTING
No. 0042

Page 4 of 26

Sample Number	2590219-4
Sample Date	Oct 02, 2025
Sample Description	Air Quality
Location	ถนนสุขุมวิทสายใหม่ (A1) (GPS 47P 0743960, 1419452)
Date Analysis Commenced	Oct 09, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	27.9 °C

Analyte	Sampled Date/Time	Unit	LOQ (LOR)	Result	Guideline Limit	Method	Testing Location
Air Testing							
Phosphoric acid *	02/10/25 - 03/10/25	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	02/10/25 - 03/10/25	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	02/10/25 - 03/10/25	mg/m ³	0.002	0.032	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sirapatt Suwanmarat

Remark :

- LOD : Limit of Detection
- <" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Thanitak.

Approved by

Thanita Kulsuriwong
Scientist (4)

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Analysis / Test Report

TESTING
No.0042

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand
21120
P/O :
Project Name : Environment : EIA
Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

Page 5 of 25

Sample Number	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
2590219-5	Oct 03, 2025	Air Quality						
Sample Description	Air Quality							
Location	พื้นที่ชุมชนบ้านนาใหม่ (A1) (GPS 47P 0742960, 1419452)							
Date Analysis Commenced	Oct 09, 2025							
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated							
Barometric Pressure	756 mmHg							
Atmospheric Temperature	28.3 °C							
Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing								
Phosphoric acid *	03/10/25 - 04/10/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	03/10/25 - 04/10/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	03/10/25 - 04/10/25	mg/m3	-	0.002	0.025	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Sipawit Suwanarat

Remark :

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237-62 ENAB



Analysis / Test Report

TESTING
No.0042

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand
21120
P/O :
Project Name : Environment : EIA
Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

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Sample Number	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
2590219-6	Oct 04, 2025	Air Quality						
Sample Description	Air Quality							
Location	พื้นที่ชุมชนบ้านนาใหม่ (A1) (GPS 47P 0742960, 1419452)							
Date Analysis Commenced	Oct 09, 2025							
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated							
Barometric Pressure	756 mmHg							
Atmospheric Temperature	27.4 °C							
Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing								
Phosphoric acid *	04/10/25 - 05/10/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	04/10/25 - 05/10/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	04/10/25 - 05/10/25	mg/m3	-	0.002	0.025	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Sipawit Suwanarat

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Analysis / Test Report

TESTING
No.0042

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120
P/O :
Project Name : Environment : EIA
Project Location :
Lot ID: 2590219
Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

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Sample Number	2590219-7
Sample Date	Oct 05, 2025
Sample Description	Air Quality
Location	ถนนวิภาวดีรังสิต (A1) (GPS 47P 0742960, 1419452)
Date Analysis Commenced	Oct 09, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	27.5 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Phosphoric acid *	05/10/25 - 06/10/25	mg/m ³	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Sulfuric acid *	05/10/25 - 06/10/25	mg/m ³	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Total Suspended Particulate	05/10/25 - 06/10/25	mg/m ³	-	0.002	0.020	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong	

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Siravit Suwammarat

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Client : Michelin Siam Co., Ltd.
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21120
P/O :
Project Name : Environment : EIA
Project Location :
Lot ID: 2590219
Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

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Sample Number	2590219-8
Sample Date	Sep 29, 2025
Sample Description	Air Quality
Location	ถนนวิภาวดีรังสิต (A2) (GPS 47P 0742003, 1417397)
Date Analysis Commenced	Oct 09, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	28.6 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Phosphoric acid *	29/09/25 - 30/09/25	mg/m ³	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Sulfuric acid *	29/09/25 - 30/09/25	mg/m ³	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Total Suspended Particulate	29/09/25 - 30/09/25	mg/m ³	-	0.002	0.051	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong	

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Siravit Suwammarat

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Analysis / Test Report

TESTING
No.0042

Lot ID: 2590219

Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand

21120

P/O : Project Name : Environment : EIA

Project Location :

Page 9 of 28

Sample Number	Sampled Date/Time	Unit	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
2590219-9	Sep 30, 2025						
Sample Description	Air Quality						
Location	thuanthuan (A2) (GPS 47P 0742003, 1417397)						
Date Analysis Commenced	Oct 09, 2025						
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated						
Barometric Pressure	756 mmHg						
Atmospheric Temperature	28.1 °C						
Analyte	Sampled Date/Time	Unit	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing							
Phosphoric acid *	30/09/25 - 01/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	30/09/25 - 01/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	30/09/25 - 01/10/25	mg/m3	0.002	0.055	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No 24-Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sitapavit Suwannarat

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Analysis / Test Report

TESTING
No.0042

Lot ID: 2590219

Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand

21120

P/O : Project Name : Environment : EIA

Project Location :

Page 10 of 28

Sample Number	Sampled Date/Time	Unit	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
2590219-10	Oct 01, 2025						
Sample Description	Air Quality						
Location	thuanthuan (A2) (GPS 47P 0742003, 1417397)						
Date Analysis Commenced	Oct 09, 2025						
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated						
Barometric Pressure	756 mmHg						
Atmospheric Temperature	28.5 °C						
Analyte	Sampled Date/Time	Unit	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing							
Phosphoric acid *	01/10/25 - 02/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	01/10/25 - 02/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	01/10/25 - 02/10/25	mg/m3	0.002	0.045	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24-Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sitapavit Suwannarat

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Lot ID: 2590219
Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

Client : Michelin Siam Co., Ltd.
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21120
P/O :
Project Name : Environment : EIA
Project Location :

Page 11 of 28

Sample Number : 2590219-11
Sample Date : Oct 02, 2025
Sample Description : Air Quality
Location : บ้านใหม่ (A2) (GPS 47P 0742003, 1417397)
Date Analysis Commenced : Oct 09, 2025
Condition of Sample : Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 27.9 °C

Analyte	Sampled Date/Time	Unit	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing							
Phosphoric acid *	02/10/25 - 03/10/25	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	02/10/25 - 03/10/25	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	02/10/25 - 03/10/25	mg/m ³	0.002	0.054	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2003 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sipawit Suwannarat

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Analysis / Test Report

TESTING
No.0042

Lot ID: 2590219
Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Ban Khai Road, Nong-Lak-Lok, Ban Khai, Rayong Thailand
21120
P/O :
Project Name : Environment : EIA
Project Location :

Sample Number : 2590219-12
Sample Date : Oct 03, 2025
Sample Description : Air Quality
Location : บ้านใหม่ (A2) (GPS 47P 0742003, 1417397)
Date Analysis Commenced : Oct 09, 2025
Condition of Sample : Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 28.3 °C

Analyte	Sampled Date/Time	Unit	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing							
Phosphoric acid *	03/10/25 - 04/10/25	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	03/10/25 - 04/10/25	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	03/10/25 - 04/10/25	mg/m ³	0.002	0.072	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2003 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sipawit Suwannarat

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21120

P/O :

Project Name : Environment : EA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025

Date Reported : Oct 21, 2025

Report Number : 3414167-1

TESTING
No.0042

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Sample Number	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
2590219-13	Oct 04, 2025	Air Quality						
Sample Description	Air Quality							
Location	ชุมชนบ้าน (A2) (GPS 479 0742003, 1417397)							
Date Analysis Commenced	Oct 09, 2025							
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated							
Barometric Pressure	756 mmHg							
Atmospheric Temperature	27.4 °C							
Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing								
Phosphoric acid *	04/10/25 - 05/10/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	04/10/25 - 05/10/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	04/10/25 - 05/10/25	mg/m3	-	0.002	0.041	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

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Sampled By : Sirapawit Suwannarat

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Thank.

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Scientist (4)

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P/O :

Project Name : Environment : EA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025

Date Reported : Oct 21, 2025

Report Number : 3414167-1

TESTING
No.0042

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Sample Number	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
2590219-14	Oct 05, 2025	Air Quality						
Sample Description	Air Quality							
Location	ชุมชนบ้าน (A2) (GPS 479 0742003, 1417397)							
Date Analysis Commenced	Oct 09, 2025							
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated							
Barometric Pressure	756 mmHg							
Atmospheric Temperature	27.5 °C							
Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing								
Phosphoric acid *	05/10/25 - 06/10/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	05/10/25 - 06/10/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	05/10/25 - 06/10/25	mg/m3	-	0.002	0.033	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sirapawit Suwannarat

Remark :

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- <" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025

Date Reported : Oct 21, 2025

Report Number : 3414167-1

TESTING
No.0042

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Sample Number	2590219-15
Sampled Date	Sep 29, 2025
Sample Description	Air Quality
Location	ท่าเรือ (A3) (GPS 47P 0744066, 1420470)
Date Analysis Commenced	Oct 09, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	28.6 °C

Analyte	Sampled Date/Time	Unit	LOD (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing							
Phosphoric acid *	29/09/25 - 30/09/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	29/09/25 - 30/09/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	29/09/25 - 30/09/25	mg/m3	0.002	0.031	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sipawit Suwanmarat

Remark :

- LOD : Limit of Detection

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Approved by

Thanita Kulsumwong
Scientist (4)

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377-02/ENGL



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025

Date Reported : Oct 21, 2025

Report Number : 3414167-1

TESTING
No.0042

Page 16 of 28

Sample Number	2590219-16
Sampled Date	Sep 30, 2025
Sample Description	Air Quality
Location	ท่าเรือ (A3) (GPS 47P 0744066, 1420470)
Date Analysis Commenced	Oct 09, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	28.1 °C

Analyte	Sampled Date/Time	Unit	LOD (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing							
Phosphoric acid *	30/09/25 - 01/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	30/09/25 - 01/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	30/09/25 - 01/10/25	mg/m3	0.002	0.025	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sipawit Suwanmarat

Remark :

- LOD : Limit of Detection

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Analysis / Test Report

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129 Moo 3, Nong-Lok-Bankhal Road, Nong-Lok, Bankhai, Rayong Thailand
21120

P/O :

Project Name : Environment : EA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025

Date Reported : Oct 21, 2025

Report Number : 3414167-1

TESTING
No.0042

Page 17 of 28

Sample Number	2590219-17
Sample Date	Oct 01, 2025
Sample Description	Air Quality
Location	พื้นที่วนอุทยาน (A3) (GPS 47P 0744066, 1420470)
Date Analysis Commenced	Oct 09, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	28.5 °C

Analyte	Sampled Date/Time	Unit	LOD (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing								
Phosphoric acid *	01/10/25 - 02/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Sulfuric acid *	01/10/25 - 02/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Total Suspended Particulate	01/10/25 - 02/10/25	mg/m3	0.002	0.027	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24-Rayong	

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sitpawit Suwannarat

Remark :

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NIGHT SOLUTIONS BUREAU 3-24-25 B1318

2292 01 (Rev)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lok-Bankhal Road, Nong-Lok, Bankhai, Rayong Thailand
21120

P/O :

Project Name : Environment : EA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025

Date Reported : Oct 21, 2025

Report Number : 3414167-1

TESTING
No.0042

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Sample Number	2590219-18
Sample Date	Oct 02, 2025
Sample Description	Air Quality
Location	พื้นที่วนอุทยาน (A3) (GPS 47P 0744066, 1420470)
Date Analysis Commenced	Oct 09, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	27.9 °C

Analyte	Sampled Date/Time	Unit	LOD (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing								
Phosphoric acid *	02/10/25 - 03/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Sulfuric acid *	02/10/25 - 03/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Total Suspended Particulate	02/10/25 - 03/10/25	mg/m3	0.002	0.022	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24-Rayong	

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sitpawit Suwannarat

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NIGHT SOLUTIONS BUREAU 3-24-25 B1318

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120

P/O : Project Name : Environment : EIA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

TESTING
No.0042

Page 13 of 25

Sample Number	2590219-19
Sample Date	Oct 03, 2025
Sample Description	Air Quality
Location	เจ็ดเสมียน (A3) (GPS 47P 0744066, 1420470)
Date Analysis Commenced	Oct 09, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	28.3 °C

Analyte	Sampled Date/Time	Unit	LOD (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing							
Phosphoric acid *	03/10/25 - 04/10/25	mg/m3	-	0.05	<0.05	Based on OSHA, ID-174-SG	- Bangkok
Sulfuric acid *	03/10/25 - 04/10/25	mg/m3	-	0.05	<0.05	Based on OSHA, ID-174-SG	- Bangkok
Total Suspended Particulate	03/10/25 - 04/10/25	mg/m3	-	0.002	0.026	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sirapatt Suwamarat

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.

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21120

P/O : Project Name : Environment : EIA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

TESTING
No.0042

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Sample Number	2590219-20
Sample Date	Oct 04, 2025
Sample Description	Air Quality
Location	เจ็ดเสมียน (A3) (GPS 47P 0744066, 1420470)
Date Analysis Commenced	Oct 09, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	27.4 °C

Analyte	Sampled Date/Time	Unit	LOD (LOR)	Result	Guideline Unit	Method	Guideline Testing Location
Air Testing							
Phosphoric acid *	04/10/25 - 05/10/25	mg/m3	-	0.05	<0.05	Based on OSHA, ID-174-SG	- Bangkok
Sulfuric acid *	04/10/25 - 05/10/25	mg/m3	-	0.05	<0.05	Based on OSHA, ID-174-SG	- Bangkok
Total Suspended Particulate	04/10/25 - 05/10/25	mg/m3	-	0.002	0.021	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sirapatt Suwamarat

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P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025

Date Reported : Oct 21, 2025

Report Number : 3414167-1

TESTING
No.0042

Page 21 of 28

Sample Number	2590219-21
Sample Date	Oct 05, 2025
Sample Description	Air Quality
Location	หน้าสวนยาง (A3) (GPS 47P 0744066, 1420470)
Date Analysis Commenced	Oct 09, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	27.5 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Phosphoric acid *	05/10/25 - 06/10/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Sulfuric acid *	05/10/25 - 06/10/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Total Suspended Particulate	05/10/25 - 06/10/25	mg/m3	-	0.002	0.020	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong	

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sippawit Suwannarat

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22/09/2025



Analysis / Test Report

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129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand
21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025

Date Reported : Oct 21, 2025

Report Number : 3414167-1

TESTING
No.0042

Page 22 of 28

Sample Number	2590219-22
Sample Date	Sep 29, 2025
Sample Description	Air Quality
Location	หน้าสวนยาง (A4) (GPS 47P 0747515, 1419157)
Date Analysis Commenced	Oct 09, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	28.6 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Phosphoric acid *	29/09/25 - 30/09/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Sulfuric acid *	29/09/25 - 30/09/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Total Suspended Particulate	29/09/25 - 30/09/25	mg/m3	-	0.002	0.022	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong	

Guideline :

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Analysis / Test Report

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21120

P/O : Project Name : Environment : EIA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

TESTING
No.0042

Page 23 of 28

Sample Number 2590219-23
Sample Date Sep 30, 2025
Sample Description Air Quality
Location อุโมงค์ลอด (A4) (GPS 47P 0747515, 1419157)
Date Analysis Commenced Oct 09, 2025
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 28.1 °C

Analyte	Sampled Date/Time	Unit	LOD (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing							
Phosphoric acid *	30/09/25 - 01/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	30/09/25 - 01/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	30/09/25 - 01/10/25	mg/m3	0.002	0.020	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

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NIGHT SOLUTIONS INNOVATE PARTNERS

3272-62/ENAL

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120

P/O : Project Name : Environment : EIA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

TESTING
No.0042

Page 24 of 28

Sample Number 2590219-24
Sample Date Oct 01, 2025
Sample Description Air Quality
Location อุโมงค์ลอด (A4) (GPS 47P 0747515, 1419157)
Date Analysis Commenced Oct 09, 2025
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 28.5 °C

Analyte	Sampled Date/Time	Unit	LOD (LOR)	Result	Guideline Unit	Method	Guideline Testing Location
Air Testing							
Phosphoric acid *	01/10/25 - 02/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	01/10/25 - 02/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	01/10/25 - 02/10/25	mg/m3	0.002	0.035	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Sirawit Suwanarat

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Analysis / Test Report

TESTING
No.0042

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhal Road, Nong-Lak-Lok, Bankhai, Rayong Thailand
21120
P/O :
Project Name : Environment : EA
Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

Page 25 of 28

Sample Number	2590219-25
Sample Date	Oct 02, 2025
Sample Description	Air Quality
Location	พื้นที่ก่อสร้าง (A4) (GPS 47P 0747515, 1419157)
Date Analysis Commenced	Oct 09, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	27.9 °C

Analyte	Sampled Date/Time	Unit	LOD (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing							
Phosphoric acid *	02/10/25 - 03/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	02/10/25 - 03/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	02/10/25 - 03/10/25	mg/m3	0.002	0.033	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Sipawit Suwannarat

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MIGHT SOLUTIONS PREVENT POLLUTION

2377-01/HAAL

Analysis / Test Report

TESTING
No.0042

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhal Road, Nong-Lak-Lok, Bankhai, Rayong Thailand
21120
P/O :
Project Name : Environment : EA
Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

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Sample Number	2590219-26
Sample Date	Oct 03, 2025
Sample Description	Air Quality
Location	พื้นที่ก่อสร้าง (A4) (GPS 47P 0747515, 1419157)
Date Analysis Commenced	Oct 09, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	28.3 °C

Analyte	Sampled Date/Time	Unit	LOD (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing							
Phosphoric acid *	03/10/25 - 04/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	03/10/25 - 04/10/25	mg/m3	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	03/10/25 - 04/10/25	mg/m3	0.002	0.026	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :

NEB No.24 : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Sipawit Suwannarat

Remark :

- LOD : Limit of Detection
- "C" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

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2377-02/HAAL

Approved by

Thanitak.

Thanita Kusumwong
Scientist (4)



Analysis / Test Report

TESTING
No. 0042

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120

P/O : Project Name : Environment : EIA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

Page 27 of 28

Sample Number 2590219-27
Sampled Date Oct 04, 2025
Sample Description Air Quality
Location อู่เรือประมง (A4) (GPS 47P 0747515, 1419157)
Date Analysis Commenced Oct 09, 2025
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 27.4 °C

Analyte	Sampled Date/Time	Unit	LOD (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing								
Phosphoric acid *	04/10/25 - 05/10/25	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG		Bangkok
Sulfuric acid *	04/10/25 - 05/10/25	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG		Bangkok
Total Suspended Particulate	04/10/25 - 05/10/25	mg/m ³	0.002	0.026	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No. 24-Rayong	

Guideline :

NEB No. 24 : Notification of the National Environmental Board, No. 24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Siravit Suwanarat

Remark :

- * LOD : Limit of Detection
- * "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- * Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Thanitak.

Approved by

Thanita Kulsunwong
Scientist (4)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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2272-02/ENAL

Analysis / Test Report

TESTING
No. 0042

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120

P/O : Project Name : Environment : EIA

Project Location :

Lot ID: 2590219

Date Received : Oct 08, 2025
Date Reported : Oct 21, 2025
Report Number : 3414167-1

Page 28 of 28

Sample Number 2590219-28
Sampled Date Oct 05, 2025
Sample Description Air Quality
Location อู่เรือประมง (A4) (GPS 47P 0747515, 1419157)
Date Analysis Commenced Oct 09, 2025
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 27.5 °C

Analyte	Sampled Date/Time	Unit	LOD (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing								
Phosphoric acid *	05/10/25 - 06/10/25	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG		Bangkok
Sulfuric acid *	05/10/25 - 06/10/25	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG		Bangkok
Total Suspended Particulate	05/10/25 - 06/10/25	mg/m ³	0.002	0.020	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No. 24-Rayong	

Guideline :

NEB No. 24 : Notification of the National Environmental Board, No. 24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Siravit Suwanarat

Remark :

- * LOD : Limit of Detection
- * "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- * Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

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Approved by

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Scientist (4)

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2272-02/ENAL



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand 21120
P/O :
Date Received : Oct 08, 2025
Date Reported : Oct 15, 2025
Report Number: 3414230-1
Project Name : Environment : EIA
Project Location :

Lot ID: 2590222

Page 1 of 2

Sample Description	Air Quality	2590222-7									
		2590222-1	2590222-2	2590222-3	2590222-4	2590222-5	2590222-6	2590222-7	2590222-8	2590222-9	2590222-10
Location	พื้นที่วัดมลพิษ (A1) (GPS 478 0742960, 1419452)										
Parameter	Nitrogen dioxide (ppm)										
Measurement Date	Sep 29, 2025 - Oct 06, 2025										
Measurement by	Sitapawit Suwanmarat										
Time											
11:00 AM - 11:00 AM		0.0013	0.0007	0.0011	0.0009	0.0012	0.0006	0.0006	0.0038	0.0022	0.0035
11:00 AM - 12:00 PM		0.0011	0.0015	0.0022	0.0006	0.0010	0.0002	0.0007	0.0036	0.0024	0.0043
12:00 PM - 01:00 PM		0.0005	0.0009	0.0008	0.0006	0.0009	0.0014	0.0007	0.0036	0.0030	0.0069
01:00 PM - 02:00 PM		0.0005	0.0004	0.0009	0.0004	0.0009	0.0017	0.0006	0.0060	0.0032	0.0083
02:00 PM - 03:00 PM		0.0006	0.0006	0.0010	0.0005	0.0009	0.0010	0.0002	0.0071	0.0034	0.0108
03:00 PM - 04:00 PM		0.0008	0.0011	0.0007	0.0010	0.0009	0.0007	0.0002	0.0056	0.0044	0.0129
04:00 PM - 05:00 PM		0.0006	0.0003	0.0010	0.0015	0.0010	0.0007	<0.0001	0.0059	0.0036	0.0128
05:00 PM - 06:00 PM		0.0006	0.0006	0.0012	0.0019	0.0018	0.0005	<0.0001	0.0040	0.0035	0.0108
06:00 PM - 07:00 PM		0.0008	0.0001	0.0007	0.0014	0.0009	0.0006	<0.0001	0.0031	0.0050	0.0093
07:00 PM - 08:00 PM		0.0006	0.0003	0.0009	0.0016	0.0011	0.0006	<0.0001	0.0027	0.0035	0.0071
08:00 PM - 09:00 PM		0.0006	0.0004	0.0008	0.0021	0.0008	0.0006	0.0001	0.0041	0.0044	0.0060
09:00 PM - 10:00 PM		0.0007	0.0004	0.0012	0.0015	0.0005	0.0016	0.0002	0.0043	0.0049	0.0041
10:00 PM - 11:00 PM		0.0007	0.0002	0.0014	0.0014	0.0007	0.0009	0.0003	0.0035	0.0033	0.0049
11:00 PM - 12:00 AM		0.0006	<0.0001	0.0010	0.0011	0.0005	0.0005	0.0002	0.0042	0.0053	0.0064
12:00 AM - 01:00 AM		0.0002	<0.0001	0.0008	0.0014	0.0004	0.0004	0.0004	0.0066	0.0064	0.0066
01:00 AM - 02:00 AM		0.0003	0.0003	0.0005	0.0010	0.0005	0.0002	<0.0001	0.0081	0.0084	0.0107
02:00 AM - 03:00 AM		0.0003	0.0003	0.0005	0.0008	0.0005	0.0003	0.0003	0.0073	0.0100	0.0132
03:00 AM - 04:00 AM		0.0002	0.0001	0.0006	0.0008	0.0004	0.0002	<0.0001	0.0049	0.0049	0.0101
04:00 AM - 05:00 AM		0.0004	0.0004	0.0005	0.0006	0.0003	0.0001	0.0003	0.0026	0.0025	0.0045
05:00 AM - 06:00 AM		0.0002	0.0001	0.0004	0.0005	0.0005	0.0001	<0.0001	0.0023	0.0025	0.0028
06:00 AM - 07:00 AM		0.0008	<0.0001	0.0005	0.0007	0.0006	0.0002	0.0005	0.0032	0.0032	0.0030
07:00 AM - 08:00 AM		0.0006	0.0012	0.0008	0.0010	0.0006	0.0004	0.0002	0.0027	0.0029	0.0033
08:00 AM - 09:00 AM		0.0005	0.0015	0.0008	0.0013	0.0004	0.0002	0.0011	0.0022	0.0039	0.0029
09:00 AM - 10:00 AM		0.0007	0.0013	0.0008	0.0013	0.0003	0.0003	0.0007	0.0021	0.0062	0.0027
Average		0.0006	0.0005	0.0009	0.0011	0.0007	0.0006	0.0003	0.0042	0.0043	0.0071
1hr - Maximum		0.0013	0.0015	0.0022	0.0021	0.0018	0.0017	0.0012	0.0081	0.0100	0.0132
Standard 1hr - Average		0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
Standard											
Reference Method											

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).
Reference Method : U.S. Environmental Protection Agency/Method Part 50 App. F (Chemiluminescence)

Please apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

Approved by

Orawan R.
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Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand 21120
P/O :
Date Received : Oct 08, 2025
Date Reported : Oct 15, 2025
Report Number: 3427599-1
Project Name : Environment : EIA
Project Location :

Lot ID: 2590222

Page 1 of 1

Sample Description	Air Quality	2590222-14									
		2590222-8	2590222-9	2590222-10	2590222-11	2590222-12	2590222-13	2590222-14	2590222-15	2590222-16	2590222-17
Location	พื้นที่วัดมลพิษ (A2) (GPS 478 0742003, 1417397)										
Parameter	Nitrogen dioxide (ppm)										
Measurement Date	Sep 29, 2025 - Oct 06, 2025										
Measurement by	Sitapawit Suwanmarat										
Time											
11:00 AM - 12:00 PM		0.0039	0.0022	0.0035	0.0034	0.0036	0.0032	0.0026	0.0038	0.0036	0.0035
12:00 PM - 01:00 PM		0.0038	0.0024	0.0043	0.0033	0.0036	0.0032	0.0028	0.0038	0.0036	0.0035
01:00 PM - 02:00 PM		0.0036	0.0030	0.0069	0.0050	0.0043	0.0043	0.0045	0.0043	0.0043	0.0045
02:00 PM - 03:00 PM		0.0060	0.0032	0.0083	0.0061	0.0055	0.0044	0.0044	0.0055	0.0055	0.0049
03:00 PM - 04:00 PM		0.0071	0.0034	0.0108	0.0070	0.0056	0.0044	0.0044	0.0056	0.0056	0.0043
04:00 PM - 05:00 PM		0.0056	0.0044	0.0129	0.0071	0.0054	0.0071	0.0126	0.0054	0.0054	0.0126
05:00 PM - 06:00 PM		0.0059	0.0036	0.0128	0.0043	0.0046	0.0079	0.0117	0.0046	0.0046	0.0117
06:00 PM - 07:00 PM		0.0040	0.0035	0.0108	0.0050	0.0028	0.0056	0.0119	0.0028	0.0028	0.0119
07:00 PM - 08:00 PM		0.0031	0.0050	0.0093	0.0029	0.0012	0.0039	0.0091	0.0012	0.0012	0.0091
08:00 PM - 09:00 PM		0.0027	0.0035	0.0071	0.0020	0.0006	0.0033	0.0061	0.0006	0.0006	0.0061
09:00 PM - 10:00 PM		0.0041	0.0044	0.0060	0.0012	0.0008	0.0014	0.0049	0.0008	0.0008	0.0049
10:00 PM - 11:00 PM		0.0043	0.0049	0.0041	0.0005	0.0011	0.0017	0.0060	0.0011	0.0011	0.0060
11:00 PM - 12:00 AM		0.0035	0.0033	0.0049	0.0012	0.0029	0.0023	0.0044	0.0029	0.0029	0.0044
12:00 AM - 01:00 AM		0.0042	0.0053	0.0064	0.0020	0.0044	0.0034	0.0059	0.0044	0.0044	0.0059
01:00 AM - 02:00 AM		0.0064	0.0053	0.0064	0.0020	0.0059	0.0045	0.0094	0.0059	0.0059	0.0094
02:00 AM - 03:00 AM		0.0081	0.0084	0.0107	0.0102	0.0060	0.0047	0.0094	0.0060	0.0060	0.0094
03:00 AM - 04:00 AM		0.0073	0.0100	0.0132	0.0108	0.0088	0.0055	0.0149	0.0088	0.0088	0.0149
04:00 AM - 05:00 AM		0.0034	0.0049	0.0101	0.0076	0.0085	0.0057	0.0104	0.0076	0.0076	0.0104
05:00 AM - 06:00 AM		0.0026	0.0025	0.0045	0.0052	0.0067	0.0052	0.0037	0.0052	0.0052	0.0037
06:00 AM - 07:00 AM		0.0023	0.0025	0.0028	0.0034	0.0050	0.0045	0.0031	0.0050	0.0050	0.0031
07:00 AM - 08:00 AM		0.0024	0.0032	0.0030	0.0032	0.0035	0.0029	0.0025	0.0032	0.0032	0.0025
08:00 AM - 09:00 AM		0.0027	0.0029	0.0026	0.0026	0.0025	0.0025	0.0110	0.0025	0.0025	0.0110
09:00 AM - 10:00 AM		0.0022	0.0039	0.0029	0.0025	0.0028	0.0023	0.0079	0.0028	0.0028	0.0079
10:00 AM - 11:00 AM		0.0021	0.0062	0.0027	0.0026	0.0026	0.0024	0.0102	0.0026	0.0026	0.0102
Average		0.0042	0.0043	0.0071	0.0044	0.0041	0.0040	0.0075	0.0041	0.0041	0.0075
1hr - Maximum		0.0081	0.0100	0.0132	0.0108	0.0088	0.0079	0.0149	0.0088	0.0088	0.0149
Standard 1hr - Average		0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
Standard											
Reference Method											

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).
Reference Method : U.S. Environmental Protection Agency/Method Part 50 App. F (Chemiluminescence)

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Approved by

Orawan R.
Orawan Rakyong
Scientist (3)

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2274-62 EMAIL



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EA
Project Location :

Lot ID: 2590222

Date Received : Oct 08, 2025
Date Reported : Oct 15, 2025
Report Number: 3427601-1

Page 1 of 1

Sample Description		Air Quality	
Location	Parameter	Nitrogen dioxide (ppm)	
Measurement Date	Measurement by	Sipawat Suwannarat	
		2590222-15	2590222-16
Time		Sep 29, 2025	Sep 30, 2025
12:00 PM - 01:00 PM		0.0048	0.0069
01:00 PM - 02:00 PM		0.0064	0.0047
02:00 PM - 03:00 PM		0.0074	0.0038
03:00 PM - 04:00 PM		0.0063	0.0028
04:00 PM - 05:00 PM		0.0115	0.0070
05:00 PM - 06:00 PM		0.0056	0.0064
06:00 PM - 07:00 PM		0.0084	0.0048
07:00 PM - 08:00 PM		0.0079	0.0065
08:00 PM - 09:00 PM		0.0027	0.0060
09:00 PM - 10:00 PM		0.0056	0.0066
10:00 PM - 11:00 PM		0.0074	0.0051
11:00 PM - 12:00 AM		0.0094	0.0029
12:00 AM - 01:00 AM		0.0023	0.0039
01:00 AM - 02:00 AM		0.0038	0.0027
02:00 AM - 03:00 AM		0.0036	0.0017
03:00 AM - 04:00 AM		0.0024	0.0018
04:00 AM - 05:00 AM		0.0043	0.0012
05:00 AM - 06:00 AM		0.0025	0.0012
06:00 AM - 07:00 AM		0.0031	0.0026
07:00 AM - 08:00 AM		0.0029	0.0012
08:00 AM - 09:00 AM		0.0011	0.0027
09:00 AM - 10:00 AM		0.0054	0.0061
10:00 AM - 11:00 AM		0.0043	0.0052
11:00 AM - 12:00 PM		0.0051	0.0062
Average		0.0050	0.0042
1hr - Maximum		0.0115	0.0070
Standard 1hr - Average		0.170	0.170
Standard		: Notification of the National Environment Board No. 33, 2009 (B.E. 2552),	
Reference Method		: U.S. Environmental Protection Agency/Method Part 50 App. F (Chemiluminescence)	

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be regarded as a guarantee of the results reported at the laboratory.

Approved by

Orawan R.
Orawan Rakying
Scientist (3)

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2075-02-0000

S:\Reports\AN SONOK\pr (S14PM)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EA
Project Location :

Lot ID: 2590222

Date Received : Oct 08, 2025
Date Reported : Oct 15, 2025
Report Number: 3427603-1

Page 1 of 1

Sample Description		Air Quality	
Location	Parameter	Air Quality	
Measurement Date	Measurement by	Air Quality	
Time		Air Quality	
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Time		Air Quality	



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lao-Lok-Bankhai Road, Nong-Lao-Lok, Bankhai, Rayong Thailand 21120

Lot ID: 2590230

Date Received : Oct 08, 2025

Date Reported : Oct 15, 2025

Report Number : 3414233-1

P/O :

Project Name : Environment : EIA

Project Location :

Sample Number 2590230-1 to 7

Parameter Wind Speed / Wind Direction

Location #NONGLAULOKBANKHAI (A1) (GPS 47P 0742960, 1419452)

Sampling Date Sep 29 - Oct 06, 2025

Sampling by Sitpavit Suwannarat

Page 1 of 2

Time	Sep 29 - Sep 30, 2025	Sep 30 - Oct 01, 2025	Oct 01 - Oct 02, 2025	Oct 02 - Oct 03, 2025	Oct 03 - Oct 04, 2025	Oct 04 - Oct 05, 2025	Oct 05 - Oct 06, 2025
WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)
10:00 AM - 11:00 AM	1.0 261.0 W	0.3 260.0 W	1.0 285.0 WNW	0.8 230.0 SW	0.3 216.0 SW	1.0 166.0 SSE	0.5 76.0 ENE
11:00 AM - 12:00 PM	0.3 206.0 SSW	0.5 190.0 S	1.2 215.0 SW	0.9 245.0 WSW	0.3 217.0 SW	0.7 245.0 WSW	0.6 59.0 ENE
12:00 PM - 01:00 PM	0.6 253.0 WSW	0.8 192.0 SSW	0.9 217.0 SW	0.6 246.0 WSW	0.5 214.0 SW	0.0 -	0.3 60.0 ENE
01:00 PM - 02:00 PM	0.3 305.0 NW	1.0 192.0 SSW	0.7 217.0 SW	1.0 270.0 W	0.7 226.0 SW	1.7 75.0 ENE	0.5 214.0 SW
02:00 PM - 03:00 PM	0.3 359.0 N	0.6 192.0 SSW	0.7 217.0 SW	0.6 200.0 SSW	0.7 240.0 WSW	0.3 218.0 SW	0.3 243.0 WSW
03:00 PM - 04:00 PM	0.9 348.0 WNW	0.7 192.0 SSW	0.3 217.0 SW	0.6 202.0 SSW	1.0 209.0 SSW	0.3 202.0 SSW	0.5 215.0 SW
04:00 PM - 05:00 PM	0.3 50.0 NE	0.7 48.0 NE	0.3 73.0 ENE	0.5 202.0 SSW	0.6 197.0 SSW	0.4 194.0 SSW	0.5 237.0 WSW
05:00 PM - 06:00 PM	0.5 77.0 ENE	0.3 144.0 SE	0.3 144.0 SE	0.3 202.0 SSW	0.3 77.0 ENE	0.7 223.0 SW	0.0 -
06:00 PM - 07:00 PM	0.3 266.0 W	0.3 182.0 S	0.3 207.0 SSW	0.6 202.0 SSW	0.5 238.0 WSW	1.9 230.0 SW	0.0 -
07:00 PM - 08:00 PM	0.4 260.0 W	0.3 286.0 WNW	0.4 311.0 NW	0.2 -	0.3 68.0 ENE	0.0 -	0.3 232.0 SW
08:00 PM - 09:00 PM	0.2 -	0.0 -	0.0 -	0.6 129.0 SE	1.1 210.0 SSW	0.0 -	0.3 232.0 SW
09:00 PM - 10:00 PM	0.6 270.0 W	0.0 -	0.0 -	0.3 192.0 SSW	0.0 -	0.0 -	0.5 236.0 SW
10:00 PM - 11:00 PM	0.3 274.0 W	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.3 237.0 WSW
11:00 PM - 12:00 AM	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.3 234.0 SW
12:00 AM - 01:00 AM	0.0 -	0.0 -	0.0 -	0.0 -	0.5 236.0 SW	0.4 290.0 WNW	0.3 312.0 NW
01:00 AM - 02:00 AM	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.6 125.0 SE
02:00 AM - 03:00 AM	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.3 178.0 S
03:00 AM - 04:00 AM	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.2 -	0.3 77.0 ENE
04:00 AM - 05:00 AM	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.3 222.0 SW	0.0 -
05:00 AM - 06:00 AM	0.0 -	0.0 -	0.0 -	0.3 217.0 SW	0.0 -	0.6 222.0 SW	0.4 47.0 NE
06:00 AM - 07:00 AM	0.3 315.0 NW	0.0 -	0.3 227.0 SW	0.5 171.0 S	0.0 -	0.5 78.0 ENE	1.0 44.0 NE
07:00 AM - 08:00 AM	0.3 315.0 NW	0.3 206.0 SSW	0.6 231.0 SW	0.6 225.0 SW	0.0 -	0.3 149.0 SSE	0.5 44.0 NE
08:00 AM - 09:00 AM	0.6 315.0 NW	0.6 207.0 SSW	0.3 232.0 SW	0.3 212.0 SSW	0.4 241.0 WSW	1.6 212.0 SSW	0.3 44.0 NE
09:00 AM - 10:00 AM	0.3 315.0 NW	0.5 204.0 SSW	0.5 229.0 SW	0.4 212.0 SSW	0.0 -	0.6 316.0 NW	0.4 45.0 NE

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Approved by

Saranyuth Jittrantont

Assistant General Manager

Location : #NONGLAULOKBANKHAI (A1) (GPS 47P 0742960, 1419452)

Approved by

Saranyuth Jittrantont

Assistant General Manager



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lao-Lok-Bankhai Road, Nong-Lao-Lok, Bankhai, Rayong Thailand 21120

Lot ID: 2590230

Date Received : Oct 08, 2025

Date Reported : Oct 15, 2025

Report Number : 3414233-1

P/O :

Project Name : Environment : EIA

Project Location :

Sample Number 2590230-1 to 7

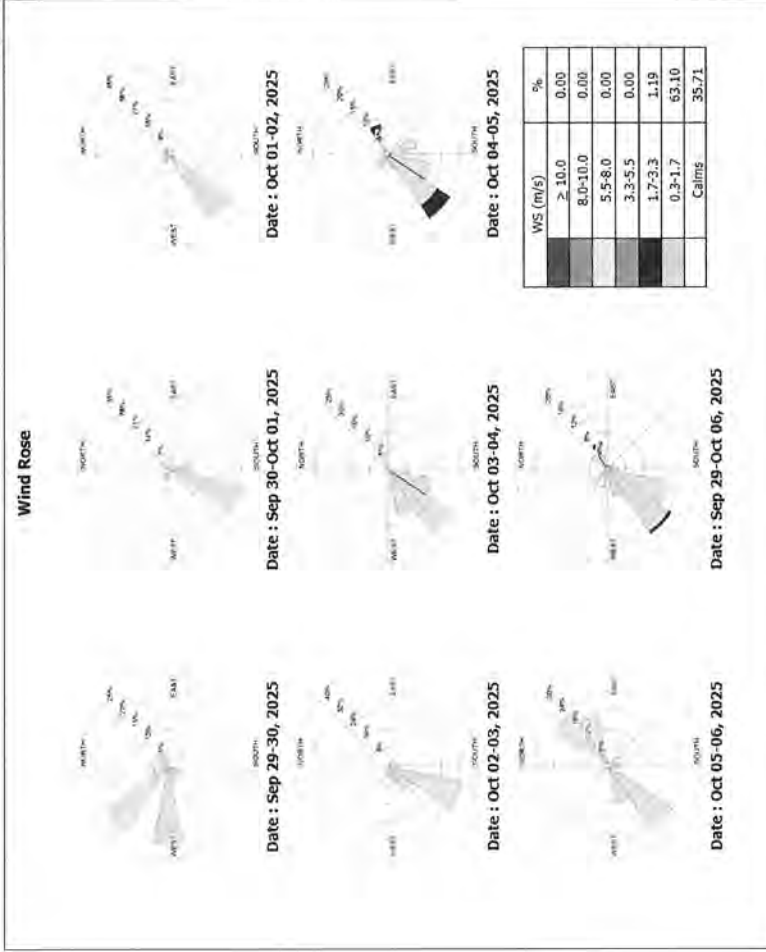
Parameter Wind Speed / Wind Direction

Location #NONGLAULOKBANKHAI (A1) (GPS 47P 0742960, 1419452)

Sampling Date Sep 29 - Oct 06, 2025

Sampling by Sitpavit Suwannarat

Page 2 of 2



The above results are valid only for the wind speed and direction (WS and WD) as indicated in this report. For part of the report, the data may be reproduced in any form without further consent from the Laboratory. A.S. Laboratory Group (Thailand) Strongly recommends that this report is not reproduced except in full.

Approved by

Saranyuth Jittrantont

Assistant General Manager

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lalok-Bankhai Road, Nong-Lalok, Bankhai, Rayong Thailand 21120

P/O:

Project Name : Environment - ETA

Project Location : LBN

Client : Michelin Siam Co., Ltd.

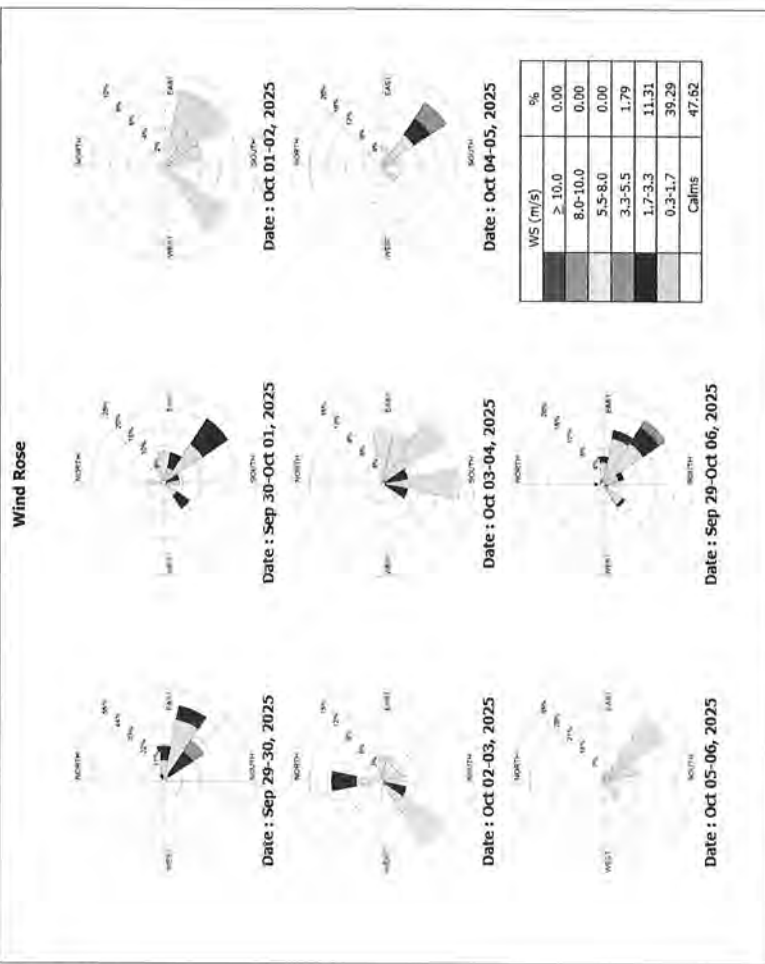
129 Moo 3, Nong-Lalok-Bankhai Road, Nong-Lalok, Bankhai, Rayong Thailand 21120

P/O:

Wind Rose

1000

1000



Location : บ้านท่าช้าง (A2) (GPS 47P 0742003, 1417397)

The above results are valid only for the analyzed/identified species(s) as indicated in this report. No part of this report or any findings may be reproduced in any form without written consent from the Laboratory. At S Laboratory Group (Thailand)

Sarayuth Jittranont

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Wentworth and A. H. Huxford, Rayong 21140 Thailand (PHONE 468 0 3304)

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Analysis / Test Report

Client : Michelin Sam Co., Ltd.

129 Moo 3, Nong-La-Lok-Bankhai Road, Nong-La-Lok, Bankhai, Rayong Thailand 21120

Lot ID: 2590230

Date Received : Oct 08, 2025

Date Reported : Oct 15, 2025

Report Number :3414233-1

P/O :

Project Name : Environment : EIA

Project Location :

Sample Number

Parameter

Location

Date

Sampling by

Page 1 of 2

2590230-15 to 21

Wind Speed / Wind Direction

พิกัดพิกัด (A3) (GPS 47P 0744066, 1420470)

Sep 29 - Oct 06, 2025

Sitapawit Suwanarat

Time	Sep 29 - Sep 30, 2025		Sep 30 - Oct 01, 2025		Oct 01 - Oct 02, 2025		Oct 02 - Oct 03, 2025		Oct 03 - Oct 04, 2025		Oct 04 - Oct 05, 2025		Oct 05 - Oct 06, 2025								
	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)							
12:00 PM - 01:00 PM	1.1	176.0	S	2.4	359.0	N	0.7	34.0	NE	1.7	144.0	SE	0.6	54.0	NE	0.4	181.0	S	0.0	-	
01:00 PM - 02:00 PM	0.3	194.0	SSW	2.3	109.0	ESE	0.0	-	-	0.4	92.0	E	1.5	310.0	NW	1.0	102.0	ESE	0.0	-	
02:00 PM - 03:00 PM	0.8	85.0	E	3.6	191.0	S	0.2	-	-	2.6	323.0	NW	1.9	189.0	S	0.5	44.0	NE	0.0	-	
03:00 PM - 04:00 PM	1.3	86.0	E	0.7	333.0	NNW	0.3	189.0	S	0.8	239.0	WSW	0.8	118.0	ESE	0.3	0.0	N	1.9	153.0	SSE
04:00 PM - 05:00 PM	0.9	150.0	SSE	0.7	345.0	NNW	0.6	193.0	SSW	0.4	26.0	NNE	0.0	-	-	1.8	189.0	S	0.7	204.0	SSW
05:00 PM - 06:00 PM	0.4	126.0	ESE	1.1	155.0	SSE	0.0	-	0.0	-	0.0	-	0.9	107.0	ESE	3.6	186.0	S	0.3	183.0	S
06:00 PM - 07:00 PM	1.0	159.0	SSE	2.3	149.0	SSE	0.0	-	0.0	-	0.0	-	0.1	-	-	0.0	-	-	0.4	169.0	S
07:00 PM - 08:00 PM	0.5	154.0	SSE	0.0	-	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.4	267.0	W	0.0	-
08:00 PM - 09:00 PM	0.8	166.0	SSE	0.5	176.0	S	0.0	-	0.0	-	0.0	-	1.3	156.0	SSE	0.0	-	-	0.0	-	-
09:00 PM - 10:00 PM	0.4	207.0	SSW	0.0	-	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.9	196.0	SSW
10:00 PM - 11:00 PM	0.9	129.0	SE	0.3	181.0	S	0.0	-	0.0	-	0.0	-	0.3	57.0	ENE	0.0	-	-	0.4	166.0	SSE
11:00 PM - 12:00 AM	0.4	287.0	NNW	0.0	-	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	-
12:00 AM - 01:00 AM	0.6	147.0	SSE	0.0	-	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.2	-	-
01:00 AM - 02:00 AM	0.9	171.0	S	0.0	-	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	-
02:00 AM - 03:00 AM	0.8	313.0	NW	0.8	171.0	S	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.6	99.0	E
03:00 AM - 04:00 AM	0.9	181.0	S	0.8	352.0	N	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.5	294.0	NNW
04:00 AM - 05:00 AM	1.0	159.0	SSE	0.2	-	-	0.0	-	0.5	65.0	ENE	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-
05:00 AM - 06:00 AM	1.2	168.0	S	0.2	-	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	-
06:00 AM - 07:00 AM	0.4	158.0	SSE	0.0	-	-	0.3	193.0	SSW	0.0	-	-	0.3	132.0	SE	0.3	235.0	SW	0.0	-	-
07:00 AM - 08:00 AM	0.5	163.0	SSE	0.0	-	-	0.3	190.0	S	0.3	64.0	ENE	0.3	133.0	SE	0.5	311.0	NW	0.3	132.0	SE
08:00 AM - 09:00 AM	1.1	146.0	SE	0.0	-	-	0.3	183.0	S	0.0	-	-	0.6	200.0	SSW	3.6	331.0	NNW	0.3	136.0	SE
09:00 AM - 10:00 AM	0.8	157.0	SSE	0.0	-	-	0.6	183.0	S	0.3	54.0	NE	0.3	109.0	ESE	1.0	201.0	SSW	0.3	190.0	S
10:00 AM - 11:00 AM	1.6	332.0	NNW	0.3	177.0	S	0.6	156.0	SSE	0.4	89.0	E	0.4	126.0	SE	0.3	113.0	ESE	0.3	196.0	SSW
11:00 AM - 12:00 PM	2.1	175.0	S	0.0	-	-	0.8	131.0	SE	0.7	140.0	SE	0.5	330.0	NNW	0.5	113.0	ESE	0.6	191.0	S

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

The above results are data only for the wind speed and direction. The results are not to be used for any other purpose. The results are not to be used for any other purpose. The results are not to be used for any other purpose.

Approved by

Saranyuth Jitranont
Assistant General Manager

The above results are data only for the wind speed and direction. The results are not to be used for any other purpose. The results are not to be used for any other purpose. The results are not to be used for any other purpose.

Approved by

Saranyuth Jitranont
Assistant General Manager

Location : พิกัดพิกัด (A3) (GPS 47P 0744066, 1420470)

Analysis / Test Report

Client : Michelin Sam Co., Ltd.

129 Moo 3, Nong-La-Lok-Bankhai Road, Nong-La-Lok, Bankhai, Rayong Thailand 21120

Lot ID: 2590230

Date Received : Oct 08, 2025

Date Reported : Oct 15, 2025

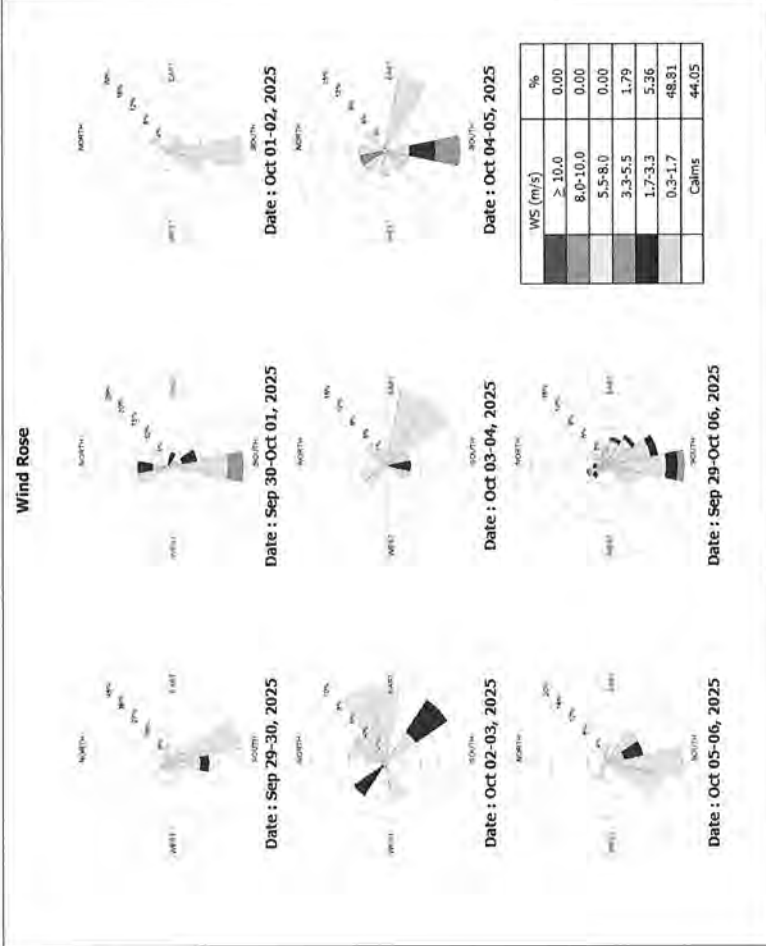
Report Number :3414233-1

P/O :

Project Name : Environment : EIA

Project Location :

Page 2 of 2



WS (m/s)	%
≥ 10.0	0.00
8.0-10.0	0.00
5.5-8.0	0.00
3.3-5.5	1.79
1.7-3.3	5.36
0.3-1.7	48.81
Calm	44.05

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Analysis / Test Report

Client - Michellin Siam Co., Ltd.

129 Moo 3, Nonnong-ai-ok-Bangkok Road, Nonnong-ai-ok, Bangkok, Rayong, Thailand 21120.

0/0

Project Name - Environment + ETA

Project Location :

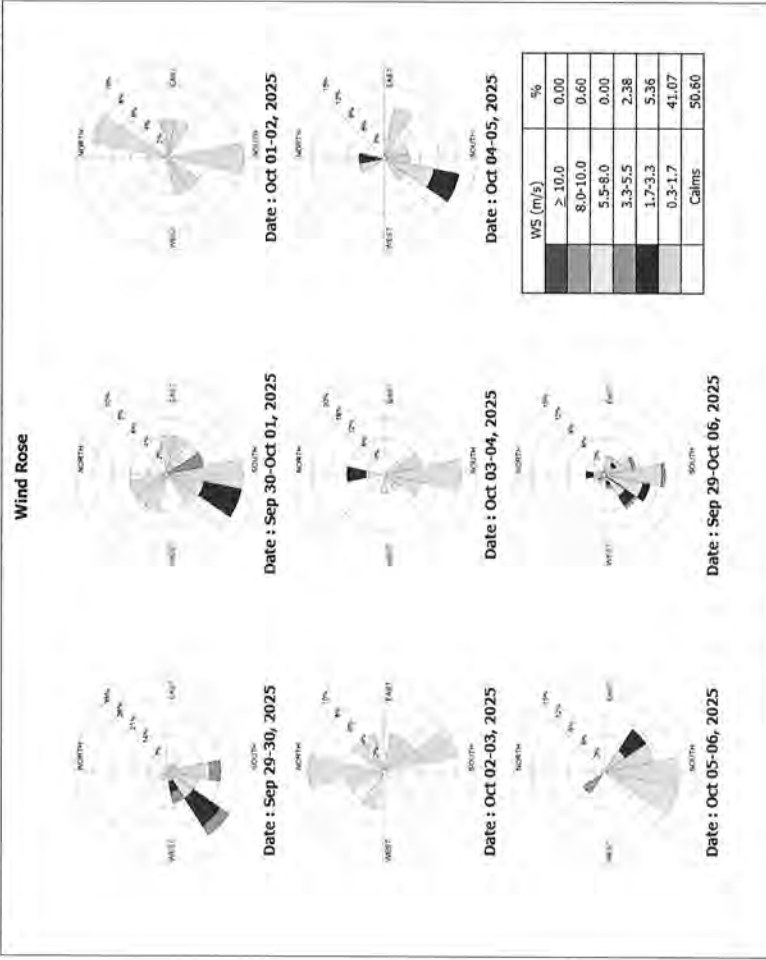
Wind Speed / Wind

Wind speed / Wind direction
Temperature (A4) (GPS A78)

520 20 04 2025

5707 '00 120 - 67 das

SITPAWIT SUWANNARAT



Location : រោងចក្រស្រាបៀង (A4) (GPS 47P 0747515 1419157)

The data in Table 6 are valid only for the individual tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. © AS Laboratory Group (Pty) Ltd.

The above results are valid only for the usual (steady-state) case (2) as illustrated in this report. No part of the report or conclusions may be reproduced or used for any other purpose without written consent from the Laboratory. At S Laboratory Group (Thailand) strongly recommends that this report is not reproduced in full.

—

Sarayuth Jittranont

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Analysis / Test Report

TESTING
No.0042

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand
21120
P/O :
Project Name : Environment : EIA
Project Location :

Lot ID: 25113039
Date Received : Dec 24, 2025
Date Reported : Jan 07, 2026
Report Number : 3473557-1

Page 1 of 4

Sample Number	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
25113039-1	Dec 23, 2025	Air Quality							
Sample Description	Air Quality								
Location	อำเภอเมืองระยอง (A1) (GPS 47P 0742560, 1419452)								
Date Analysis Commenced	Dec 25, 2025								
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated								
Barometric Pressure	752 mmHg								
Atmospheric Temperature	31.2 °C								
Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Phosphoric acid *	23/12/25 - 24/12/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Sulfuric acid *	23/12/25 - 24/12/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Total Suspended Particulate	23/12/25 - 24/12/25	mg/m3	-	0.002	0.052	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong	

Guideline :
NEB No.24 : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Anuwat Tena

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This report shall not be reproduced or used in any manner without the written approval of the laboratory.

Approved by

Thanitak.

Thanita Kulsumwong
Scientist (4)

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3/7/25 (7) FINAL



Analysis / Test Report

TESTING
No.0042

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand
21120
P/O :
Project Name : Environment : EIA
Project Location :

Lot ID: 25113039
Date Received : Dec 24, 2025
Date Reported : Jan 07, 2026
Report Number : 3473557-1

Page 2 of 4

Sample Number	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
25113039-2	Dec 23, 2025	Air Quality							
Sample Description	Air Quality								
Location	อำเภอเมืองระยอง (A2) (GPS 47P 0742003, 1417397)								
Date Analysis Commenced	Dec 25, 2025								
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated								
Barometric Pressure	752 mmHg								
Atmospheric Temperature	31.2 °C								
Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Phosphoric acid *	23/12/25 - 24/12/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Sulfuric acid *	23/12/25 - 24/12/25	mg/m3	-	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	-	Bangkok
Total Suspended Particulate	23/12/25 - 24/12/25	mg/m3	-	0.002	0.081	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong	

Guideline :
NEB No.24 : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Anuwat Tena

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This report shall not be reproduced or used in any manner without the written approval of the laboratory.

Approved by

Thanitak.

Thanita Kulsumwong
Scientist (4)

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MIGHT SOLUTIONS EIGHTY EIGHT

3/7/25 (7) FINAL



Analysis / Test Report

TESTING
No. 0042

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120
Lot ID: 25113039
Date Received : Dec 24, 2025
Date Reported : Jan 07, 2026
Report Number : 3473557-1

P/O :
Project Name : Environment : EIA
Project Location :

Page 3 of 4

Sample Number 25113039-3
Sample Date Dec 23, 2025
Sample Description Air Quality
Location 1km11111111 (A3) (GPS 47P 0744066, 1420470)
Date Analysis Commenced Dec 25, 2025
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure 752 mmHg
Atmospheric Temperature 31.2 °C

Analyte	Unit	LOD (LOR)	Result	Guideline Limit	Method	Testing Location
Air Testing						
Phosphoric acid *	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	mg/m ³	0.002	0.095	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :
NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Anuwet Tena

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Thanitak.

Approved by

Thanita Kulsurwong
Scientist (4)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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NIGHT SOLUTIONS

2272-62 (EMAIL)



Analysis / Test Report

TESTING
No. 0042

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120
Lot ID: 25113039
Date Received : Dec 24, 2025
Date Reported : Jan 07, 2026
Report Number : 3473557-1

P/O :
Project Name : Environment : EIA
Project Location :

Page 4 of 4

Sample Number 25113039-4
Sample Date Dec 23, 2025
Sample Description Air Quality
Location 1km11111111 (A4) (GPS 47P 0747515, 1419157)
Date Analysis Commenced Dec 25, 2025
Condition of Sample Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one sorbent tube, refrigerated
Barometric Pressure 752 mmHg
Atmospheric Temperature 31.2 °C

Analyte	Unit	LOD (LOR)	Result	Guideline Limit	Method	Testing Location
Air Testing						
Phosphoric acid *	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	mg/m ³	0.05	<0.05	No Standard	Based on OSHA, ID-174-SG	Bangkok
Total Suspended Particulate	mg/m ³	0.002	0.062	0.33	United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)	NEB No.24 Rayong

Guideline :
NEB No.24 : Notification of the National Environmental Board, No.24, 2004 (B.E.2547) dated September 22, 2004
Sampled By : Anuwet Tena

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Thanitak.

Approved by

Thanita Kulsurwong
Scientist (4)

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NIGHT SOLUTIONS

2272-62 (EMAIL)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :
Lot ID: 25113034
Date Received : Dec 24, 2025
Date Reported : Dec 29, 2025
Report Number: 3481095-1

Page 1 of 1

Sample Description	Air Quality	Time	25113034-1	Dec 23, 2025
Location	สถานีควบคุมคุณภาพอากาศ (A1) (GPS 47P 0742960, 1419452)	08:00 AM - 09:00 AM	0.0008	-
Parameter	Nitrogen dioxide (ppm)	09:00 AM - 10:00 AM	0.0012	-
Measurement Date	Dec 23, 2025 - Dec 24, 2025	10:00 AM - 11:00 AM	0.0024	-
Measurement by	Anuwet Terna	11:00 AM - 12:00 PM	0.0017	-
		12:00 PM - 01:00 PM	0.0030	-
		01:00 PM - 02:00 PM	0.0032	-
		02:00 PM - 03:00 PM	0.0035	-
		03:00 PM - 04:00 PM	0.0037	-
		04:00 PM - 05:00 PM	0.0032	-
		05:00 PM - 06:00 PM	0.0040	-
		06:00 PM - 07:00 PM	0.0053	-
		07:00 PM - 08:00 PM	0.0056	-
		08:00 PM - 09:00 PM	0.0064	-
		09:00 PM - 10:00 PM	0.0072	-
		10:00 PM - 11:00 PM	0.0070	-
		11:00 PM - 12:00 AM	0.0063	-
		12:00 AM - 01:00 AM	0.0057	-
		01:00 AM - 02:00 AM	0.0054	-
		02:00 AM - 03:00 AM	0.0052	-
		03:00 AM - 04:00 AM	0.0047	-
		04:00 AM - 05:00 AM	0.0044	-
		05:00 AM - 06:00 AM	0.0039	-
		06:00 AM - 07:00 AM	0.0041	-
		07:00 AM - 08:00 AM	0.0054	-
Average			0.0043	-
1hr - Maximum			0.0072	-
Standard 1hr - Average			0.170	-
Standard				-
Reference Method	: Notification of the National Environment Board No. 33, 2009 (B.E. 2552). : U.S. Environmental Protection Agency Method Part 50 App. F (Chemiluminescence)			

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

Approved by

Orawan R.

Orawan Rakying
Scientist (3)

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :
Lot ID: 25113034
Date Received : Dec 24, 2025
Date Reported : Dec 29, 2025
Report Number: 3481096-1

Page 1 of 1

Sample Description	Air Quality	Time	25113034-2	Dec 23, 2025
Location	สถานีควบคุมคุณภาพอากาศ (A2) (GPS 47P 0742003, 1417397)	08:00 AM - 09:00 AM	0.0016	-
Parameter	Nitrogen dioxide (ppm)	09:00 AM - 10:00 AM	0.0023	-
Measurement Date	Dec 23, 2025 - Dec 24, 2025	10:00 AM - 11:00 AM	0.0025	-
Measurement by	Anuwet Terna	11:00 AM - 12:00 PM	0.0038	-
		12:00 PM - 01:00 PM	0.0034	-
		01:00 PM - 02:00 PM	0.0024	-
		02:00 PM - 03:00 PM	0.0021	-
		03:00 PM - 04:00 PM	0.0025	-
		04:00 PM - 05:00 PM	0.0010	-
		05:00 PM - 06:00 PM	0.0025	-
		06:00 PM - 07:00 PM	0.0023	-
		07:00 PM - 08:00 PM	0.0024	-
		08:00 PM - 09:00 PM	0.0022	-
		09:00 PM - 10:00 PM	0.0022	-
		10:00 PM - 11:00 PM	0.0020	-
		11:00 PM - 12:00 AM	0.0022	-
		12:00 AM - 01:00 AM	0.0021	-
		01:00 AM - 02:00 AM	0.0018	-
		02:00 AM - 03:00 AM	0.0020	-
		03:00 AM - 04:00 AM	0.0009	-
		04:00 AM - 05:00 AM	0.0053	-
		05:00 AM - 06:00 AM	0.0056	-
		06:00 AM - 07:00 AM	0.0009	-
		07:00 AM - 08:00 AM	0.0012	-
Average			0.0024	-
1hr - Maximum			0.0053	-
Standard 1hr - Average			0.170	-
Standard				-
Reference Method	: Notification of the National Environment Board No. 33, 2009 (B.E. 2552). : U.S. Environmental Protection Agency Method Part 50 App. F (Chemiluminescence)			

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

Approved by

Orawan R.

Orawan Rakying
Scientist (3)

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lao-Lok-Bankhai Road, Nong-Lao-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :

Lot ID: 25113034
Date Received : Dec 24, 2025
Date Reported : Dec 29, 2025
Report Number: 3481097-1

Page 1 of 1

Sample Description		Air Quality	
Location	พื้นที่บ้านใหม่ (A3) (GPS 47P 0744066, 1420470)	Location	พื้นที่บ้านใหม่ (A4) (GPS 47P 0747515, 1419157)
Parameter	Nitrogen dioxide (ppm)	Parameter	Nitrogen dioxide (ppm)
Measurement Date	Dec 23, 2025 - Dec 24, 2025	Measurement Date	Dec 23, 2025 - Dec 24, 2025
Measurement by	Anuwet Tena	Measurement by	Anuwet Tena

Time		25113034-3 Dec 23, 2025	
09:00 AM - 10:00 AM		0.0058	-
10:00 AM - 11:00 AM		0.0049	-
11:00 AM - 12:00 PM		0.0050	-
12:00 PM - 01:00 PM		0.0071	-
01:00 PM - 02:00 PM		0.0075	-
02:00 PM - 03:00 PM		0.0078	-
03:00 PM - 04:00 PM		0.0078	-
04:00 PM - 05:00 PM		0.0087	-
05:00 PM - 06:00 PM		0.0088	-
06:00 PM - 07:00 PM		0.0091	-
07:00 PM - 08:00 PM		0.0089	-
08:00 PM - 09:00 PM		0.0108	-
09:00 PM - 10:00 PM		0.0096	-
10:00 PM - 11:00 PM		0.0094	-
11:00 PM - 12:00 AM		0.0088	-
12:00 AM - 01:00 AM		0.0088	-
01:00 AM - 02:00 AM		0.0095	-
02:00 AM - 03:00 AM		0.0091	-
03:00 AM - 04:00 AM		0.0092	-
04:00 AM - 05:00 AM		0.0094	-
05:00 AM - 06:00 AM		0.0116	-
06:00 AM - 07:00 AM		0.0100	-
07:00 AM - 08:00 AM		0.0105	-
08:00 AM - 09:00 AM		0.0089	-
Average		0.0087	-
1hr - Maximum		0.0116	-
Standard 1hr - Average		0.170	-

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).
Reference Method : U.S. Environmental Protection Agency/Method Part 50 App. F (Chemiluminescence)

Approved by

Orawan R.
Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lao-Lok-Bankhai Road, Nong-Lao-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :

Lot ID: 25113034
Date Received : Dec 24, 2025
Date Reported : Dec 29, 2025
Report Number: 3481098-1

Page 1 of 1

Sample Description		Air Quality	
Location	พื้นที่บ้านใหม่ (A4) (GPS 47P 0747515, 1419157)	Location	พื้นที่บ้านใหม่ (A4) (GPS 47P 0747515, 1419157)
Parameter	Nitrogen dioxide (ppm)	Parameter	Nitrogen dioxide (ppm)
Measurement Date	Dec 23, 2025 - Dec 24, 2025	Measurement Date	Dec 23, 2025 - Dec 24, 2025
Measurement by	Anuwet Tena	Measurement by	Anuwet Tena

Time		25113034-4 Dec 23, 2025	
09:00 AM - 10:00 AM		0.0010	-
10:00 AM - 11:00 AM		0.0012	-
11:00 AM - 12:00 PM		0.0011	-
12:00 PM - 01:00 PM		0.0012	-
01:00 PM - 02:00 PM		0.0011	-
02:00 PM - 03:00 PM		0.0011	-
03:00 PM - 04:00 PM		0.0011	-
04:00 PM - 05:00 PM		0.0011	-
05:00 PM - 06:00 PM		0.0011	-
06:00 PM - 07:00 PM		0.0011	-
07:00 PM - 08:00 PM		0.0011	-
08:00 PM - 09:00 PM		0.0011	-
09:00 PM - 10:00 PM		0.0012	-
10:00 PM - 11:00 PM		0.0011	-
11:00 PM - 12:00 AM		0.0012	-
12:00 AM - 01:00 AM		0.0012	-
01:00 AM - 02:00 AM		0.0012	-
02:00 AM - 03:00 AM		0.0011	-
03:00 AM - 04:00 AM		0.0011	-
04:00 AM - 05:00 AM		0.0011	-
05:00 AM - 06:00 AM		0.0011	-
06:00 AM - 07:00 AM		0.0012	-
07:00 AM - 08:00 AM		0.0011	-
08:00 AM - 09:00 AM		0.0011	-
Average		0.0011	-
1hr - Maximum		0.0012	-
Standard 1hr - Average		0.170	-

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).
Reference Method : U.S. Environmental Protection Agency/Method Part 50 App. F (Chemiluminescence)

Approved by

Orawan R.
Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Bankhai, Rayong Thailand 21120

Lot ID: 25113040

Date Received : Dec 24, 2025

Date Reported : Dec 29, 2025

Report Number : 3473558-1

P/O :

Project Name : Environment : EIA

Project Location :

Sample Number 25113040-1

Parameter Wind Speed / Wind Direction

Location ช้างนาสวนผลไม้ (A1) (GPS 47P 0742960, 1419452)

Sampling Date Dec 23 - Dec 24, 2025

Sampling by Anuwet Terna

Time	Dec 23 - Dec 24, 2025											
	WS (m/s)	WD (deg)										
09:00 AM - 10:00 AM	1.1	85.0	E									
10:00 AM - 11:00 AM	1.1	76.0	ENE									
11:00 AM - 12:00 PM	0.0	-	-									
12:00 PM - 01:00 PM	0.0	-	-									
01:00 PM - 02:00 PM	2.4	95.0	E									
02:00 PM - 03:00 PM	2.0	202.0	SSW									
03:00 PM - 04:00 PM	0.6	200.0	SSW									
04:00 PM - 05:00 PM	0.0	-	-									
05:00 PM - 06:00 PM	0.0	-	-									
06:00 PM - 07:00 PM	0.9	167.0	SSE									
07:00 PM - 08:00 PM	0.3	253.0	WSW									
08:00 PM - 09:00 PM	0.1	-	-									
09:00 PM - 10:00 PM	0.3	172.0	S									
10:00 PM - 11:00 PM	0.5	57.0	ENE									
11:00 PM - 12:00 AM	0.0	-	-									
12:00 AM - 01:00 AM	0.5	103.0	ESE									
01:00 AM - 02:00 AM	1.5	124.0	SE									
02:00 AM - 03:00 AM	0.0	-	-									
03:00 AM - 04:00 AM	0.0	-	-									
04:00 AM - 05:00 AM	0.9	176.0	S									
05:00 AM - 06:00 AM	2.1	261.0	W									
06:00 AM - 07:00 AM	0.9	156.0	SSE									
07:00 AM - 08:00 AM	0.1	-	-									
08:00 AM - 09:00 AM	0.3	211.0	SSW									

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Approved by

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Bankhai, Rayong Thailand 21120

Lot ID: 25113040

Date Received : Dec 24, 2025

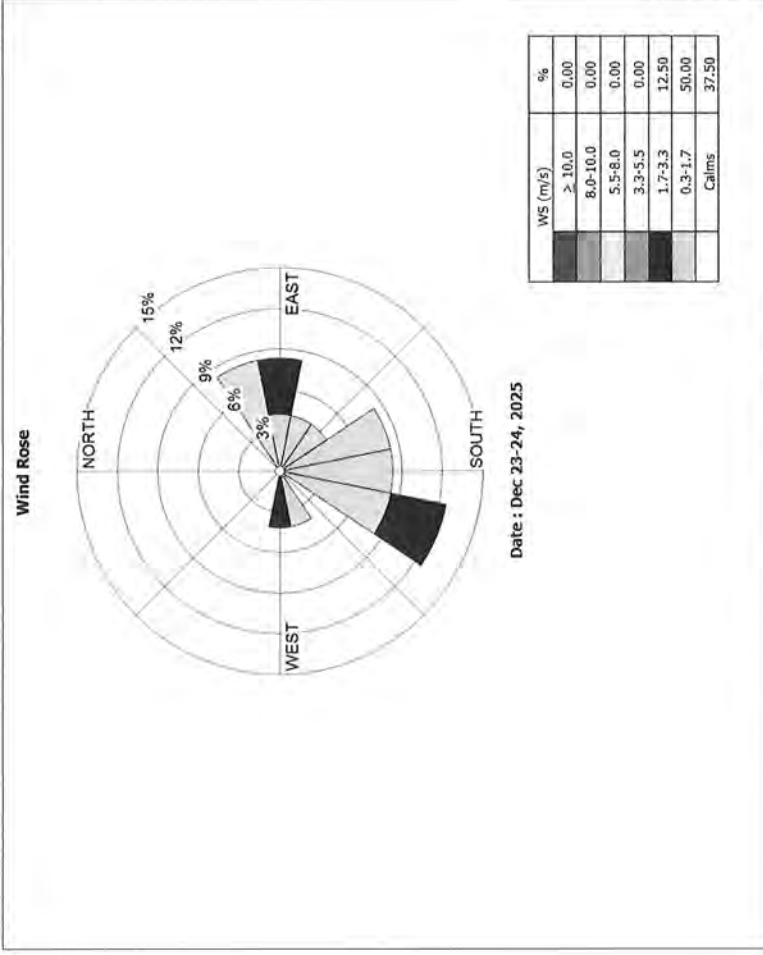
Date Reported : Dec 29, 2025

Report Number : 3473558-1

P/O :

Project Name : Environment : EIA

Project Location :



Location : ช้างนาสวนผลไม้ (A1) (GPS 47P 0742960, 1419452)

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Approved by

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Analysis / Test Report

Lot ID: 25113040

Date Received : Dec 24, 2025

Date Reported : Dec 29, 2025

Report Number :3473558-1

P/O:

Project Name : Environment : EIA

Project Location :

Project Location:

Sample Number	25113040-2
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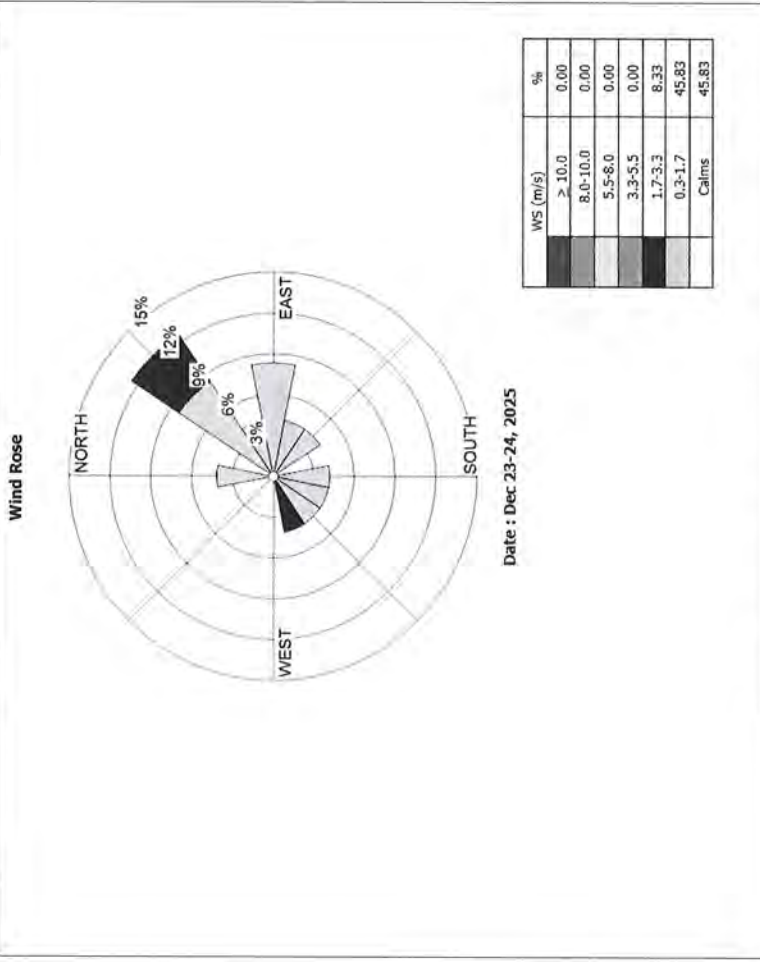
Parameter	Wind Speed / Wind Direction
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Location
บ้านท่ากุ่มโบราณ (A2) (GPS 47P 0742003, 1417397)

Sampling Date	Dec 23 - Dec 24, 2025
---------------	-----------------------

Sampling Date	Sampling by	Antwater Temp	Dec 22 - Dec 27, 2002
12/22/02	W. J. Matthews	10.0	10.0
12/23/02	W. J. Matthews	10.0	10.0
12/24/02	W. J. Matthews	10.0	10.0
12/25/02	W. J. Matthews	10.0	10.0
12/26/02	W. J. Matthews	10.0	10.0
12/27/02	W. J. Matthews	10.0	10.0

Official Journal	in English



Location : บ้านปากน้ำโพธิ์ (A2) (GPS 47P 0742003 1417397)

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Acknowledgments

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 140/141, 142/143, 144/145, 146/147, 148/149, 150/151, 152/153, 154/155, 156/157, 158/159, 160/161, 162/163, 164/165, 166/167, 168/169, 170/171, 172/173, 174/175, 176/177, 178/179, 180/181, 182/183, 184/185, 186/187, 188/189, 190/191, 192/193, 194/195, 196/197, 198/199, 200/201, 202/203, 204/205, 206/207, 208/209, 210/211, 212/213, 214/215, 216/217, 218/219, 220/221, 222/223, 224/225, 226/227, 228/229, 230/231, 232/233, 234/235, 236/237, 238/239, 240/241, 242/243, 244/245, 246/247, 248/249, 250/251, 252/253, 254/255, 256/257, 258/259, 260/261, 262/263, 264/265, 266/267, 268/269, 270/271, 272/273, 274/275, 276/277, 278/279, 280/281, 282/283, 284/285, 286/287, 288/289, 290/291, 292/293, 294/295, 296/297, 298/299, 300/301, 302/303, 304/305, 306/307, 308/309, 310/311, 312/313, 314/315, 316/317, 318/319, 320/321, 322/323, 324/325, 326/327, 328/329, 330/331, 332/333, 334/335, 336/337, 338/339, 340/341, 342/343, 344/345, 346/347, 348/349, 350/351, 352/353, 354/355, 356/357, 358/359, 360/361, 362/363, 364/365, 366/367, 368/369, 370/371, 372/373, 374/375, 376/377, 378/379, 380/381, 382/383, 384/385, 386/387, 388/389, 390/391, 392/393, 394/395, 396/397, 398/399, 400/401, 402/403, 404/405, 406/407, 408/409, 410/411, 412/413, 414/415, 416/417, 418/419, 420/421, 422/423, 424/425, 426/427, 428/429, 430/431, 432/433, 434/435, 436/437, 438/439, 440/441, 442/443, 444/445, 446/447, 448/449, 450/451, 452/453, 454/455, 456/457, 458/459, 460/461, 462/463, 464/465, 466/467, 468/469, 470/471, 472/473, 474/475, 476/477, 478/479, 480/481, 482/483, 484/485, 486/487, 488/489, 490/491, 492/493, 494/495, 496/497, 498/499, 500/501, 502/503, 504/505, 506/507, 508/509, 510/511, 512/513, 514/515, 516/517, 518/519, 520/521, 522/523, 524/525, 526/527, 528/529, 530/531, 532/533, 534/535, 536/537, 538/539, 540/541, 542/543, 544/545, 546/547, 548/549, 550/551, 552/553, 554/555, 556/557, 558/559, 560/561, 562/563, 564/565, 566/567, 568/569, 570/571, 572/573, 574/575, 576/577, 578/579, 580/581, 582/583, 584/585, 586/587, 588/589, 590/591, 592/593, 594/595, 596/597, 598/599, 600/601, 602/603, 604/605, 606/607, 608/609, 610/611, 612/613, 614/615, 616/617, 618/619, 620/621, 622/623, 624/625, 626/627, 628/629, 630/631, 632/633, 634/635, 636/637, 638/639, 640/641, 642/643, 644/645, 646/647, 648/649, 650/651, 652/653, 654/655, 656/657, 658/659, 660/661, 662/663, 664/665, 666/667, 668/669, 670/671, 672/673, 674/675, 676/677, 678/679, 680/681, 682/683, 684/685, 686/687, 688/689, 690/691, 692/693, 694/695, 696/697, 698/699, 700/701, 702/703, 704/705, 706/707, 708/709, 710/711, 712/713, 714/715, 716/717, 718/719, 720/721, 722/723, 724/725, 726/727, 728/729, 730/731, 732/733, 734/735, 736/737, 738/739, 740/741, 742/743, 744/745, 746/747, 748/749, 750/751, 752/753, 754/755, 756/757, 758/759, 760/761, 762/763, 764/765, 766/767, 768/769, 770/771, 772/773, 774/775, 776/777, 778/779, 780/781, 782/783, 784/785, 786/787, 788/789, 790/791, 792/793, 794/795, 796/797, 798/799, 800/801, 802/803, 804/805, 806/807, 808/809, 810/811, 812/813, 814/815, 816/817, 818/819, 820/821, 822/823, 824/825, 826/827, 828/829, 830/831, 832/833, 834/835, 836/837, 838/839, 840/841, 842/843, 844/845, 846/847, 848/849, 850/851, 852/853, 854/855, 856/857, 858/859, 860/861, 862/863, 864/865, 866/867, 868/869, 870/871, 872/873, 874/875, 876/877, 878/879, 880/881, 882/883, 884/885, 886/887, 888/889, 890/891, 892/893, 894/895, 896/897, 898/899, 900/901, 902/903, 904/905, 906/907, 908/909, 910/911, 912/913, 914/915, 916/917, 918/919, 920/921, 922/923, 924/925, 926/927, 928/929, 930/931, 932/933, 934/935, 936/937, 938/939, 940/941, 942/943, 944/945, 946/947, 948/949, 950/951, 952/953, 954/955, 956/957, 958/959, 960/961, 962/963, 964/965, 966/967, 968/969, 970/971, 972/973, 974/975, 976/977, 978/979, 980/981, 982/983, 984/985, 986/987, 988/989, 990/991, 992/993, 994/995, 996/997, 998/999, 1000/1001, 1002/1003, 1004/1005, 1006/1007, 1008/1009, 1010/1011, 1012/1013, 1014/1015, 1016/1017, 1018/1019, 1020/1021, 1022/1023, 1024/1025, 1026/1027, 1028/1029, 1030/1031, 1032/1033, 1034/1035,

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-La-Lok-Bankhai Road, Nong-La-Lok, Bankhai, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

Sample Number 25113040-3

Parameter Wind Speed / Wind Direction

Location จันทบุรี (A3) (GPS 47P 0744066, 1420470)

Sampling Date Dec 23 - Dec 24, 2025

Sampling by Anuwat Tera

Lot ID: 25113040

Date Received : Dec 24, 2025

Date Reported : Dec 29, 2025

Report Number :3473558-1

Page 1 of 2

Time	Dec 23 - Dec 24, 2025											
	WS (m/s)	WD (deg)										
10:00 AM - 11:00 AM	2.3	113.0	ESE	-	-	-	-	-	-	-	-	-
11:00 AM - 12:00 PM	2.1	137.0	SE	-	-	-	-	-	-	-	-	-
12:00 PM - 01:00 PM	0.4	85.0	E	-	-	-	-	-	-	-	-	-
01:00 PM - 02:00 PM	2.5	237.0	WSW	-	-	-	-	-	-	-	-	-
02:00 PM - 03:00 PM	1.8	265.0	W	-	-	-	-	-	-	-	-	-
03:00 PM - 04:00 PM	1.2	187.0	S	-	-	-	-	-	-	-	-	-
04:00 PM - 05:00 PM	1.9	142.0	SE	-	-	-	-	-	-	-	-	-
05:00 PM - 06:00 PM	0.8	204.0	SSW	-	-	-	-	-	-	-	-	-
06:00 PM - 07:00 PM	0.0	-	-	-	-	-	-	-	-	-	-	-
07:00 PM - 08:00 PM	0.0	-	-	-	-	-	-	-	-	-	-	-
08:00 PM - 09:00 PM	0.0	-	-	-	-	-	-	-	-	-	-	-
09:00 PM - 10:00 PM	0.2	-	-	-	-	-	-	-	-	-	-	-
10:00 PM - 11:00 PM	0.0	-	-	-	-	-	-	-	-	-	-	-
11:00 PM - 12:00 AM	0.0	-	-	-	-	-	-	-	-	-	-	-
12:00 AM - 01:00 AM	1.3	13.0	NNE	-	-	-	-	-	-	-	-	-
01:00 AM - 02:00 AM	1.0	210.0	SSW	-	-	-	-	-	-	-	-	-
02:00 AM - 03:00 AM	0.1	-	-	-	-	-	-	-	-	-	-	-
03:00 AM - 04:00 AM	0.0	-	-	-	-	-	-	-	-	-	-	-
04:00 AM - 05:00 AM	0.3	11.0	N	-	-	-	-	-	-	-	-	-
05:00 AM - 06:00 AM	0.0	-	-	-	-	-	-	-	-	-	-	-
06:00 AM - 07:00 AM	0.0	-	-	-	-	-	-	-	-	-	-	-
07:00 AM - 08:00 AM	1.9	20.0	NNE	-	-	-	-	-	-	-	-	-
08:00 AM - 09:00 AM	0.6	31.0	NNE	-	-	-	-	-	-	-	-	-
09:00 AM - 10:00 AM	1.0	45.0	NE	-	-	-	-	-	-	-	-	-

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

The data used in this report is for the purpose of the project only. It is not to be used for any other purpose without the prior written consent of the client. ALS Laboratory Group (Thailand) Co., Ltd. is not responsible for any errors or omissions in this report.

Approved by

Sarayu Jitranont
Assistant General Manager

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Live Sciences

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RIGHT SOLUTIONS RIGHT PARTNER



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-La-Lok-Bankhai Road, Nong-La-Lok, Bankhai, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

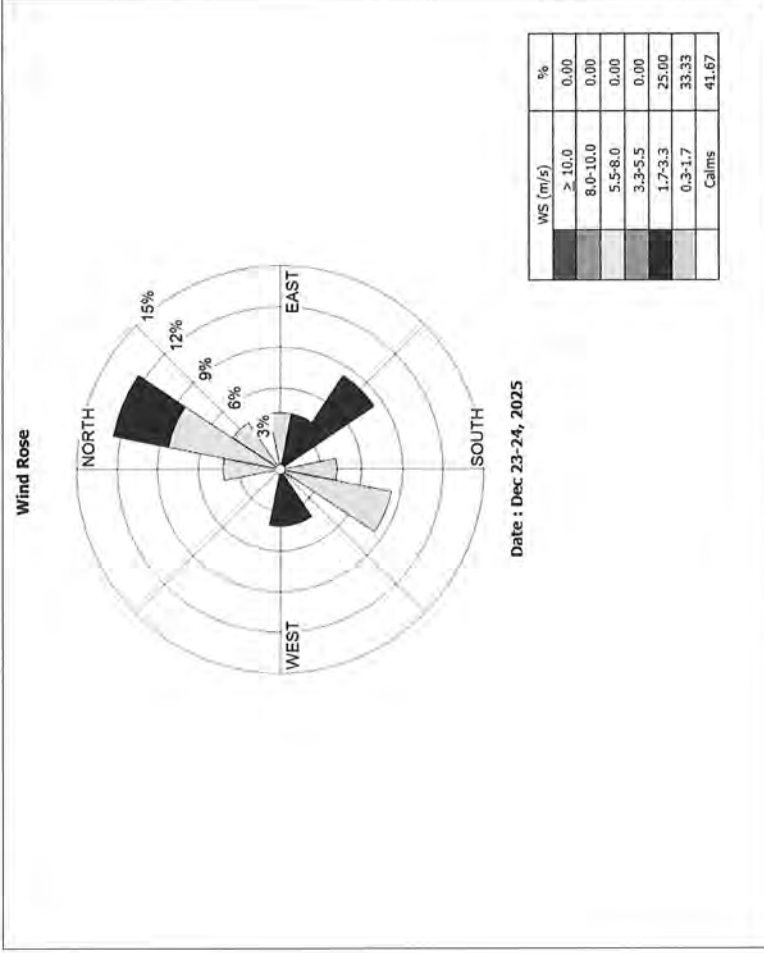
Lot ID: 25113040

Date Received : Dec 24, 2025

Date Reported : Dec 29, 2025

Report Number :3473558-1

Page 2 of 2



Location : จันทบุรี (A3) (GPS 47P 0744066, 1420470)

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Approved by

Sarayu Jitranont
Assistant General Manager

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lok-Bankhai Road, Nong-Lok, Bankhai, Rayong Thailand 21120

Lot ID: 25113040
Date Received :Dec 24, 2025
Date Reported :Dec 29, 2025
Report Number :3473558-1

P/O :
Project Name : Environment : EIA
Project Location :

Sample Number 25113040-4
Parameter Wind Speed / Wind Direction
Location บ้านนาสาร (A4) (GPS 47P 0747515, 1419157)
Sampling Date Dec 23 - Dec 24, 2025
Sampling by Anuwit Tenta

Time	Dec 23 - Dec 24, 2025																			
	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)	WS (m/s)	WD (deg)
10:00 AM - 11:00 AM	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM - 12:00 PM	1.7	52.0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12:00 PM - 01:00 PM	0.8	122.0	ESE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
01:00 PM - 02:00 PM	1.9	74.0	ENE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02:00 PM - 03:00 PM	2.3	178.0	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03:00 PM - 04:00 PM	1.8	152.0	SSE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04:00 PM - 05:00 PM	0.3	283.0	WNW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05:00 PM - 06:00 PM	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06:00 PM - 07:00 PM	1.2	281.0	W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07:00 PM - 08:00 PM	1.6	213.0	SSW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08:00 PM - 09:00 PM	0.9	187.0	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09:00 PM - 10:00 PM	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 PM - 11:00 PM	1.1	299.0	WNW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 PM - 12:00 AM	2.0	216.0	SW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12:00 AM - 01:00 AM	1.1	228.0	SW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
01:00 AM - 02:00 AM	1.2	245.0	WSW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02:00 AM - 03:00 AM	0.5	248.0	WSW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03:00 AM - 04:00 AM	0.4	242.0	WSW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04:00 AM - 05:00 AM	0.6	242.0	WSW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05:00 AM - 06:00 AM	0.3	242.0	WSW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06:00 AM - 07:00 AM	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07:00 AM - 08:00 AM	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08:00 AM - 09:00 AM	1.0	331.0	NNW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09:00 AM - 10:00 AM	0.6	342.0	NNW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

Approved by

Sarayuht Jitranont
Assistant General Manager

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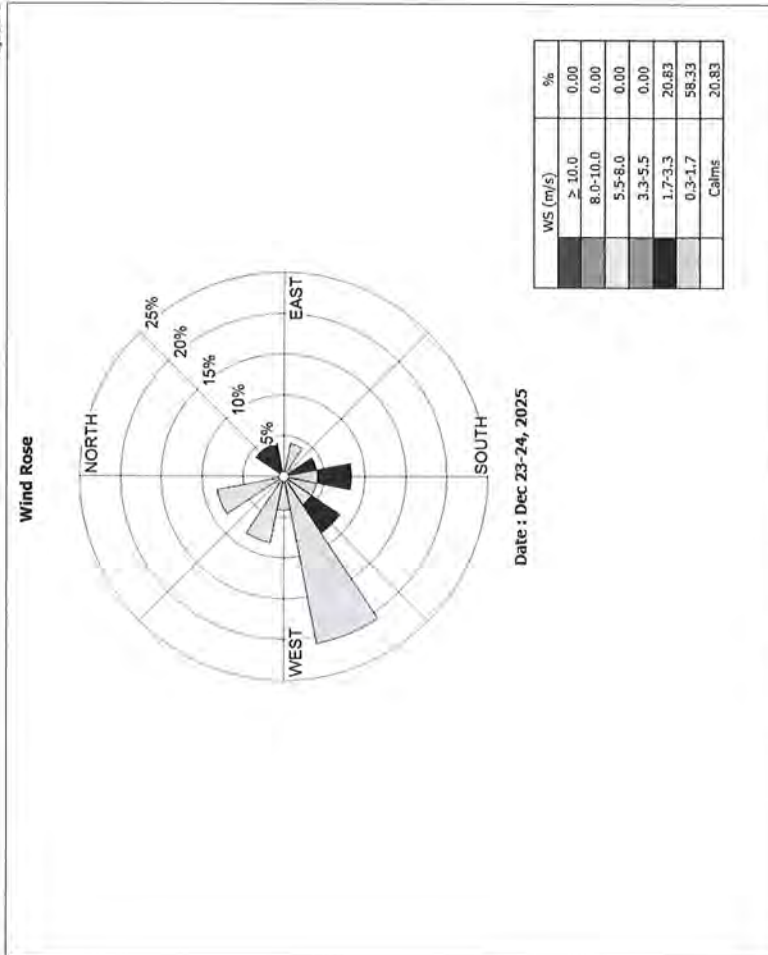


Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lok-Bankhai Road, Nong-Lok, Bankhai, Rayong Thailand 21120

Lot ID: 25113040
Date Received :Dec 24, 2025
Date Reported :Dec 29, 2025
Report Number :3473558-1

P/O :
Project Name : Environment : EIA
Project Location :



Location : บ้านนาสาร (A4) (GPS 47P 0747515, 1419157)

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Sarayuht Jitranont
Assistant General Manager

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ภาคผนวก ค-3

ระดับเสียงโดยทั่วไป



TESTING
No.0042

Lot ID: 2590231

Date Received : Oct 08, 2025
Date Reported : Oct 11, 2025
Report Number: 3426255-1

Page 1 of 1



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :

Sample Number : 2590231-1
Parameter : Noise (Leq 24 hrs.)
Location : หมู่ 3 ถนนสุขุมวิท (GPS 47P 0743667, 1419318)
Measurement Date : Sep 29 - Sep 30, 2025
Measurement by : Sitapawit Suwannarat
Sound Level meter : Serial No. 1122578

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	53.8	75.2	51.2
10:00 AM - 11:00 AM	54.2	69.2	51.2
11:00 AM - 12:00 PM	54.5	72.0	50.8
12:00 PM - 01:00 PM	54.2	70.6	50.9
01:00 PM - 02:00 PM	54.5	70.2	45.7
02:00 PM - 03:00 PM	55.7	68.5	46.5
03:00 PM - 04:00 PM	60.6	71.4	47.2
04:00 PM - 05:00 PM	56.0	71.0	45.5
05:00 PM - 06:00 PM	51.1	76.3	46.6
06:00 PM - 07:00 PM	51.7	76.1	47.1
07:00 PM - 08:00 PM	51.3	63.8	48.6
08:00 PM - 09:00 PM	50.8	67.6	47.7
09:00 PM - 10:00 PM	49.2	65.2	47.0
10:00 PM - 11:00 PM	48.3	62.2	45.6
11:00 PM - 12:00 AM	47.1	64.0	45.1
12:00 AM - 01:00 AM	50.3	69.4	49.0
01:00 AM - 02:00 AM	51.0	57.7	49.4
02:00 AM - 03:00 AM	50.4	66.0	49.4
03:00 AM - 04:00 AM	53.2	71.7	49.9
04:00 AM - 05:00 AM	57.4	81.0	49.0
05:00 AM - 06:00 AM	50.8	63.5	48.8
06:00 AM - 07:00 AM	51.2	75.9	49.3
07:00 AM - 08:00 AM	49.9	63.8	49.1
08:00 AM - 09:00 AM	52.4	71.8	51.1
Leq Average 24 hrs. (dB(A))	53.7		
Lmax (dB(A))	81.0		
L90 (dB(A))			48.8
Ldn (dB(A))	59.0		
Standard (dB(A))	70	115	
Reference Method : ISO 1996-1 : 2016			
Standard : 1. ใช้มาตรฐานการวัดค่าเสียงตามเกณฑ์ ฉบับที่ 15 (พ.ศ. 2540) เพื่อการประเมินผลกระทบสิ่งแวดล้อม 2. ใช้มาตรฐานการวัดค่าเสียงตามเกณฑ์ ฉบับที่ 15 (พ.ศ. 2540) เพื่อการประเมินผลกระทบสิ่งแวดล้อมตามข้อกำหนด			
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.			

Technical Management

Tharitat.

Tharita Kulsurwong
Scientist (4)

Approved by

Supt S.

Supot Salamtien
Section Head

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2275-631 EMAIL

31Report_Air Noise.pdf (11:58AM)



TESTING
No.0042

Lot ID: 2590231

Date Received : Oct 08, 2025
Date Reported : Oct 11, 2025
Report Number: 3426255-1

Page 1 of 1



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :

Sample Number : 2590231-2
Parameter : Noise (Leq 24 hrs.)
Location : หมู่ 3 ถนนสุขุมวิท (GPS 47P 0743667, 1419318)
Measurement Date : Sep 30 - Oct 01, 2025
Measurement by : Sitapawit Suwannarat
Sound Level meter : Serial No. 1122578

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	57.3	70.7	52.4
10:00 AM - 11:00 AM	56.3	72.6	52.3
11:00 AM - 12:00 PM	56.3	85.1	51.1
12:00 PM - 01:00 PM	56.6	82.5	49.2
01:00 PM - 02:00 PM	54.9	80.9	47.6
02:00 PM - 03:00 PM	51.6	68.1	47.6
03:00 PM - 04:00 PM	53.7	66.7	47.2
04:00 PM - 05:00 PM	50.1	65.5	47.4
05:00 PM - 06:00 PM	50.0	68.4	46.7
06:00 PM - 07:00 PM	55.4	77.5	46.2
07:00 PM - 08:00 PM	49.0	64.6	45.9
08:00 PM - 09:00 PM	49.7	75.3	46.2
09:00 PM - 10:00 PM	49.1	70.7	46.2
10:00 PM - 11:00 PM	48.4	69.5	45.5
11:00 PM - 12:00 AM	47.5	61.9	45.8
12:00 AM - 01:00 AM	48.1	65.6	46.0
01:00 AM - 02:00 AM	47.4	63.2	45.9
02:00 AM - 03:00 AM	46.7	72.5	43.9
03:00 AM - 04:00 AM	58.0	82.6	42.6
04:00 AM - 05:00 AM	69.4	100.4	56.8
05:00 AM - 06:00 AM	58.2	83.4	53.5
06:00 AM - 07:00 AM	53.6	67.2	51.5
07:00 AM - 08:00 AM	54.6	70.8	52.5
08:00 AM - 09:00 AM	55.8	73.9	54.2
Leq Average 24 hrs. (dB(A))	57.8		
Lmax (dB(A))		100.4	
L90 (dB(A))			47.2
Ldn (dB(A))	66.6		
Standard (dB(A))	70	115	
Reference Method : ISO 1996-1 : 2016			
Standard : 1. ใช้มาตรฐานการวัดค่าเสียงตามเกณฑ์ ฉบับที่ 15 (พ.ศ. 2540) เพื่อการประเมินผลกระทบสิ่งแวดล้อม 2. ใช้มาตรฐานการวัดค่าเสียงตามเกณฑ์ ฉบับที่ 15 (พ.ศ. 2540) เพื่อการประเมินผลกระทบสิ่งแวดล้อมตามข้อกำหนด			
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.			

Technical Management

Tharitat.

Tharita Kulsurwong
Scientist (4)

Approved by

Supt S.

Supot Salamtien
Section Head

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2275-631 EMAIL

31Report_Air Noise.pdf (11:58AM)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :
Lot ID: 2590231
Date Received : Oct 08, 2025
Date Reported : Oct 11, 2025
Report Number: 3426257-1

Page 1 of 1

Sample Number	2590231-3
Parameter	Noise (Leq 24 hrs.)
Location	พื้นที่โครงการพัฒนา (GPS 47P 0743667, 1419318)
Measurement Date	Oct 01 - Oct 02, 2025
Measurement by	Sitapavil Suwanarat
Sound Level meter	Serial No. 1122578

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	52.4	76.0	50.3
10:00 AM - 11:00 AM	55.2	82.3	46.7
11:00 AM - 12:00 PM	55.9	87.0	46.3
12:00 PM - 01:00 PM	50.5	70.8	46.3
01:00 PM - 02:00 PM	54.6	80.0	47.3
02:00 PM - 03:00 PM	55.1	79.9	48.3
03:00 PM - 04:00 PM	55.2	81.0	49.0
04:00 PM - 05:00 PM	54.1	82.2	48.2
05:00 PM - 06:00 PM	54.9	87.5	47.4
06:00 PM - 07:00 PM	54.1	71.2	47.3
07:00 PM - 08:00 PM	49.6	63.6	48.4
08:00 PM - 09:00 PM	49.2	66.6	47.4
09:00 PM - 10:00 PM	52.6	74.2	45.8
10:00 PM - 11:00 PM	50.5	69.5	42.6
11:00 PM - 12:00 AM	45.1	67.1	40.4
12:00 AM - 01:00 AM	44.4	63.2	40.6
01:00 AM - 02:00 AM	46.9	71.2	41.0
02:00 AM - 03:00 AM	47.9	68.9	41.6
03:00 AM - 04:00 AM	52.5	72.6	45.1
04:00 AM - 05:00 AM	56.0	71.9	49.9
05:00 AM - 06:00 AM	56.1	72.7	48.3
06:00 AM - 07:00 AM	56.5	76.3	50.6
07:00 AM - 08:00 AM	56.9	74.1	50.8
08:00 AM - 09:00 AM	53.6	71.8	45.5
Leq Average 24 hrs. (dB(A))	53.6	87.5	47.3
Lmax (dB(A))			
L90 (dB(A))			
L01 (dB(A))	59.4		
Standard (dB(A))	70	115	

Reference Method : ISO 1996-1 : 2016
Standard : 1. ประกาศกระทรวงมหาดไทย เรื่อง ค่ามาตรฐานระดับเสียงรบกวนในชุมชน พ.ศ. 2540
2. ประกาศกระทรวงมหาดไทย เรื่อง ค่ามาตรฐานระดับเสียงรบกวนในชุมชน พ.ศ. 2540

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Thanitak.

Thantita Kulsurwong
Scientist (4)

Approved by

Supt S.

Supot Salamteh
Section Head



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :
Lot ID: 2590231
Date Received : Oct 08, 2025
Date Reported : Oct 11, 2025
Report Number: 3426258-1

Page 1 of 1

Sample Number	2590231-4
Parameter	Noise (Leq 24 hrs.)
Location	พื้นที่โครงการพัฒนา (GPS 47P 0743667, 1419318)
Measurement Date	Oct 02 - Oct 03, 2025
Measurement by	Sitapavil Suwanarat
Sound Level meter	Serial No. 1122578

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	52.8	74.2	44.3
10:00 AM - 11:00 AM	53.9	71.7	51.0
11:00 AM - 12:00 PM	54.6	75.9	51.1
12:00 PM - 01:00 PM	54.8	77.0	51.1
01:00 PM - 02:00 PM	56.3	79.2	52.1
02:00 PM - 03:00 PM	55.7	68.5	46.5
03:00 PM - 04:00 PM	60.6	71.4	47.2
04:00 PM - 05:00 PM	56.0	71.0	45.5
05:00 PM - 06:00 PM	51.1	76.3	46.6
06:00 PM - 07:00 PM	51.7	76.1	47.1
07:00 PM - 08:00 PM	51.3	63.8	48.6
08:00 PM - 09:00 PM	50.8	67.6	47.7
09:00 PM - 10:00 PM	49.2	65.2	47.0
10:00 PM - 11:00 PM	48.3	62.2	45.6
11:00 PM - 12:00 AM	47.1	64.0	45.1
12:00 AM - 01:00 AM	48.5	62.1	45.5
01:00 AM - 02:00 AM	45.8	59.6	43.8
02:00 AM - 03:00 AM	46.1	56.7	44.0
03:00 AM - 04:00 AM	47.3	60.2	44.8
04:00 AM - 05:00 AM	46.9	59.2	44.7
05:00 AM - 06:00 AM	48.6	67.8	45.8
06:00 AM - 07:00 AM	49.0	66.9	46.1
07:00 AM - 08:00 AM	51.8	69.6	48.0
08:00 AM - 09:00 AM	50.9	67.3	47.3
Leq Average 24 hrs. (dB(A))	53.0	79.2	46.5
Lmax (dB(A))			
L90 (dB(A))			
L01 (dB(A))	56.0	115	
Standard (dB(A))	70		

Reference Method : ISO 1996-1 : 2016
Standard : 1. ประกาศกระทรวงมหาดไทย เรื่อง ค่ามาตรฐานระดับเสียงรบกวนในชุมชน พ.ศ. 2540
2. ประกาศกระทรวงมหาดไทย เรื่อง ค่ามาตรฐานระดับเสียงรบกวนในชุมชน พ.ศ. 2540

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Thanitak.

Thantita Kulsurwong
Scientist (4)

Approved by

Supt S.

Supot Salamteh
Section Head



Analysis / Test Report

TESTING
No.0042

Lot ID: 2590231

Date Received : Oct 08, 2025
Date Reported : Oct 11, 2025
Report Number: 3426259-1

Page 1 of 1



Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :

Sample Number	2590231-5
Parameter	Noise (Leq 24 hrs.)
Location	พื้นที่โครงการบ้านพัก (GPS 47P 0743667, 1419318)
Measurement Date	Oct 03 - Oct 04, 2025
Measurement by	Sitawit Suwanarat
Sound Level meter	Serial No. 1122578

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	53.6	69.8	45.7
10:00 AM - 11:00 AM	54.3	73.5	46.9
11:00 AM - 12:00 PM	55.0	73.7	46.8
12:00 PM - 01:00 PM	55.1	75.3	47.8
01:00 PM - 02:00 PM	55.1	73.1	48.8
02:00 PM - 03:00 PM	56.1	71.5	49.6
03:00 PM - 04:00 PM	56.5	76.3	50.6
04:00 PM - 05:00 PM	55.1	73.6	48.3
05:00 PM - 06:00 PM	53.8	71.8	48.6
06:00 PM - 07:00 PM	53.1	70.7	46.4
07:00 PM - 08:00 PM	52.1	73.4	45.3
08:00 PM - 09:00 PM	50.6	73.2	44.1
09:00 PM - 10:00 PM	51.2	73.6	43.1
10:00 PM - 11:00 PM	49.1	72.6	41.7
11:00 PM - 12:00 AM	47.4	72.1	40.9
12:00 AM - 01:00 AM	49.2	66.8	46.5
01:00 AM - 02:00 AM	47.3	67.1	46.3
02:00 AM - 03:00 AM	51.7	65.0	46.6
03:00 AM - 04:00 AM	48.6	59.3	46.3
04:00 AM - 05:00 AM	49.6	58.9	46.3
05:00 AM - 06:00 AM	50.6	71.2	47.4
06:00 AM - 07:00 AM	51.4	80.5	47.6
07:00 AM - 08:00 AM	50.2	69.3	48.2
08:00 AM - 09:00 AM	50.2	70.7	48.5

Leq Average 24 hrs. (dB(A))

Lmax (dB(A))

L90 (dB(A))

Ldn (dB(A))

Standard (dB(A))

Reference Method : ISO 1996-1 : 2016

Standard : 1. ใช้มาตรฐานการวัดเสียงตามข้อกำหนดของกรมส่งเสริมการค้าระหว่างประเทศ (พ.ร.บ. 2540) สำหรับการวัดเสียงรบกวนในชุมชน
2. ใช้มาตรฐานการวัดเสียงตามข้อกำหนดของกรมส่งเสริมการค้าระหว่างประเทศ (พ.ร.บ. 2540) สำหรับการวัดเสียงรบกวนในชุมชน

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Thanitak.

Approved by

Supt S.

Supot Salanteh
Section Head

Scientist (4)



Analysis / Test Report

TESTING
No.0042

Lot ID: 2590231

Date Received : Oct 08, 2025
Date Reported : Oct 11, 2025
Report Number: 3426260-1

Page 1 of 1



Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :

Sample Number	2590231-6
Parameter	Noise (Leq 24 hrs.)
Location	พื้นที่โครงการบ้านพัก (GPS 47P 0743667, 1419318)
Measurement Date	Oct 04 - Oct 05, 2025
Measurement by	Sitawit Suwanarat
Sound Level meter	Serial No. 1122578

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	57.4	79.2	48.9
10:00 AM - 11:00 AM	54.8	81.2	50.1
11:00 AM - 12:00 PM	56.0	77.8	49.5
12:00 PM - 01:00 PM	52.8	79.3	47.5
01:00 PM - 02:00 PM	50.9	73.1	42.6
02:00 PM - 03:00 PM	53.3	83.6	44.5
03:00 PM - 04:00 PM	51.2	71.9	45.3
04:00 PM - 05:00 PM	52.2	76.7	43.4
05:00 PM - 06:00 PM	57.4	86.2	44.3
06:00 PM - 07:00 PM	58.9	87.5	44.3
07:00 PM - 08:00 PM	54.0	83.7	46.9
08:00 PM - 09:00 PM	53.2	75.7	47.7
09:00 PM - 10:00 PM	53.8	80.0	49.1
10:00 PM - 11:00 PM	60.6	88.1	47.9
11:00 PM - 12:00 AM	50.5	64.0	48.0
12:00 AM - 01:00 AM	50.0	77.1	46.4
01:00 AM - 02:00 AM	47.9	66.6	45.8
02:00 AM - 03:00 AM	49.9	72.7	46.7
03:00 AM - 04:00 AM	47.7	62.3	46.1
04:00 AM - 05:00 AM	46.4	59.2	45.2
05:00 AM - 06:00 AM	44.5	59.3	41.5
06:00 AM - 07:00 AM	42.2	62.5	40.1
07:00 AM - 08:00 AM	49.8	81.7	40.9
08:00 AM - 09:00 AM	44.5	63.8	39.8

Leq Average 24 hrs. (dB(A))

Lmax (dB(A))

L90 (dB(A))

Ldn (dB(A))

Standard (dB(A))

Reference Method : ISO 1996-1 : 2016

Standard : 1. ใช้มาตรฐานการวัดเสียงตามข้อกำหนดของกรมส่งเสริมการค้าระหว่างประเทศ (พ.ร.บ. 2540) สำหรับการวัดเสียงรบกวนในชุมชน
2. ใช้มาตรฐานการวัดเสียงตามข้อกำหนดของกรมส่งเสริมการค้าระหว่างประเทศ (พ.ร.บ. 2540) สำหรับการวัดเสียงรบกวนในชุมชน

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Thanitak.

Approved by

Supt S.

Supot Salanteh
Section Head

Scientist (4)



Analysis / Test Report



Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

TESTING

No.0042

Lot ID: 2590231

Date Received : Oct 08, 2025

Date Reported : Oct 11, 2025

Report Number: 9426261-1

Page 1 of 1

Sample Number	2590231-7
Parameter	Noise (Leq 24 hrs.)
Location	บริเวณทางเข้าหมู่บ้าน (GPS 47P 0743567, 1419318)
Measurement Date	Oct 05 - Oct 06, 2025
Measurement by	Sitapavil Suwanarat
Sound Level meter	Serial No. 1122578

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	47.2	69.2	41.0
10:00 AM - 11:00 AM	52.6	80.9	45.2
11:00 AM - 12:00 PM	54.9	79.5	47.4
12:00 PM - 01:00 PM	51.9	74.3	42.8
01:00 PM - 02:00 PM	50.9	73.1	42.6
02:00 PM - 03:00 PM	53.3	83.6	44.5
03:00 PM - 04:00 PM	51.2	71.9	45.3
04:00 PM - 05:00 PM	52.2	76.7	43.4
05:00 PM - 06:00 PM	57.4	86.2	44.3
06:00 PM - 07:00 PM	58.9	87.5	44.3
07:00 PM - 08:00 PM	54.0	83.7	46.9
08:00 PM - 09:00 PM	53.2	75.7	47.7
09:00 PM - 10:00 PM	53.8	80.0	48.1
10:00 PM - 11:00 PM	51.7	74.6	41.4
11:00 PM - 12:00 AM	51.9	72.5	42.7
12:00 AM - 01:00 AM	49.4	64.1	48.1
01:00 AM - 02:00 AM	49.0	66.8	47.3
02:00 AM - 03:00 AM	48.6	57.6	47.2
03:00 AM - 04:00 AM	47.8	58.6	46.6
04:00 AM - 05:00 AM	48.3	63.4	46.4
05:00 AM - 06:00 AM	51.4	71.3	47.3
06:00 AM - 07:00 AM	53.9	86.4	44.6
07:00 AM - 08:00 AM	52.9	77.0	44.4
08:00 AM - 09:00 AM	51.6	75.9	44.0

Leq Average 24 hrs. (dB(A))	53.1
Lmax (dB(A))	87.5
L90 (dB(A))	44.6
Ldn (dB(A))	

Standard (dB(A)) 70

Reference Method : ISO 1996-1 : 2016

Standard : 1. ใช้มาตรฐานการวัดระดับเสียงตามข้อกำหนด 15 (พ.ศ. 2540) สำหรับการตรวจวัดระดับเสียงต่อเนื่องทั่วไป
2. ใช้มาตรฐานการวัดระดับเสียงตามข้อกำหนด 15 (พ.ศ. 2540) สำหรับการตรวจวัดระดับเสียงต่อเนื่องทั่วไป

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Thanitak.

Thanita Kulsurwong
Scientist (4)

Approved by

Supt S.

Supot Salambh
Section Head

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2272-627 EMAIL

S. Upaporn, Air Noise (p) (124PH)

ภาคผนวก ค-4

คุณภาพน้ำทิ้ง



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location:

TESTING
No.0042
Lot ID: 2556891
Date Received : Jul 15, 2025
Date Reported : Jul 22, 2025
Report Number : 3333793-1

Page 1 of 2

Sample Number	2556891-1
Sampled Date	Jul 15, 2025 3:20 PM
Sample Description	Wastewater
Location	Effluent (Holding pond 5,000 m3)
Date Analysis Commenced	Jul 15, 2025
Condition of Sample	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	6.7	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	28	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Color (at Original pH)	ADMT	-	5	15	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMT	-	5	12	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	7.9	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (8)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-CI (F)	Rayong
Temperature *	Degree C	-	-	35.2	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	928	≤3000	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2590 C	Rayong

Technical Management

Photchanas

Photchanas Seeda
Scientist (4)
โทรศัพท์ ๐-๒๖๒๖-๐๐๒๘

Approved by

D. Chongchon

Dej Chongchon
Senior Manager
โทรศัพท์ ๐-๒๖๒๖-๐๐๐๑

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Huakdaeng Rayong 21140 Thailand PHONE +66 0 3304 8555 FAX +66 0 3304 8556
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2025-07 (P&M)

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location:

TESTING
No.0042
Lot ID: 2556891
Date Received : Jul 15, 2025
Date Reported : Jul 22, 2025
Report Number : 3333793-1

Page 2 of 2

Sample Number	2556891-1
Sampled Date	Jul 15, 2025 3:20 PM
Sample Description	Wastewater
Location	Effluent (Holding pond 5,000 m3)
Date Analysis Commenced	Jul 15, 2025
Condition of Sample	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	9	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of The Ministry of Natural Resource and Environment dated June 07, B.E.2560 (2017).
Sampling By : Nattawat Abthongprommarat โทรศัพท์ ๐-๒๖๒๖-๐๐๐๖ , Pattarapol Sawangtalam โทรศัพท์ ๐-๒๖๒๖-๐๐๐๒

Remark :
- LOD : Limit of Detection
- "≤" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Photchanas

Photchanas Seeda
Scientist (4)
โทรศัพท์ ๐-๒๖๒๖-๐๐๒๘

Approved by

D. Chongchon

Dej Chongchon
Senior Manager
โทรศัพท์ ๐-๒๖๒๖-๐๐๐๑

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2025-07 (P&M)

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

TESTING

No.0009

Lot ID: 2556891

Date Received : Jul 15, 2025

Date Reported : Jul 22, 2025

Report Number : 3333793-2

Page 1 of 1

Sample Number 2556891-1

Sampled Date Jul 15, 2025 3:20 PM

Sample Description Wastewater

Location Effluent (Holding pond 5,000 m3)

Date Analysis Commenced Jul 16, 2025

Condition of Sample Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.003	0.0005	0.18	≤2.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B.3030 F	Bangkok
Zinc	mg/L	0.003	0.005	0.23	≤5.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B.3030 F	Bangkok

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Nattawut Abthompranarat รหัสผู้ตรวจ ๖-204-๙-0002

Remark :

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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Sawitree N.

Sawitree Nosingiam
Manager

Approved by

Kanokorn Anek

Assistant General Manager

รหัสผู้ตรวจ ๖-204-๙-0004

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

TESTING

No.0009

Lot ID: 2556891

Date Received : Jul 15, 2025

Date Reported : Jul 22, 2025

Report Number : 3333793-3

Page 1 of 1

Sample Number 2556891-1

Sampled Date Jul 15, 2025 3:20 PM

Sample Description Wastewater

Location Effluent (Holding pond 5,000 m3)

Date Analysis Commenced Jul 15, 2025

Condition of Sample Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.33	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B.3030 F	Bangkok
Water Testing							
Conductivity at 25 Degree C	micromhos/cm	-	0.5	1295	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Dissolved Oxygen	mg/L	-	0.1	4.4	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (G)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Nattawut Abthompranarat รหัสผู้ตรวจ ๖-204-๙-0002

Remark :

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Approved by

Sawitree N.

Sawitree Nosingiam
Manager

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :
TESTING
No.0042
Lot ID: 2566795
Date Received : Aug 14, 2025
Date Reported : Aug 21, 2025
Report Number : 3359409-1

Page 1 of 2

Sample Number	Sampled Date	Sample Description	Location	Date Analysis Commenced	Condition of Sample	Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
2566795-1	Aug 14, 2025 10:45 AM	Wastewater	Effluent (Holding pond 5,000 m3)	Aug 14, 2025	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)	Water Testing							
BOD (5 days at 20 Degree C)							mg/L	-	2.0	16.4	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD							mg/L	1.5	25	32	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Color (at Original pH)							ADMT	-	5	10	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)							ADMT	-	5	9	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Conductivity at 25 Degree C *							micromhos/cm	-	0.5	1897	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Oil & Grease							mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C								-	-	7.4	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Residual Free Chlorine *							mg/L	-	0.1	<0.1	≤1.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Rayong
Temperature *							Degree C	-	-	34.3	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong

Technical Management
Photchanas
Photchanas Seeda
Scientist (4)
มีตราสารฯ 7-323-4-0028
Approved by
Dej Changchon
Senior Manager
มีตราสารฯ 7-323-4-0001

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.
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P/O :
Project Name : Environment : EIA
Project Location :
TESTING
No.0042
Lot ID: 2566795
Date Received : Aug 14, 2025
Date Reported : Aug 21, 2025
Report Number : 3359409-1

Page 2 of 2

Sample Number	Sampled Date	Sample Description	Location	Date Analysis Commenced	Condition of Sample	Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
2566795-1	Aug 14, 2025 10:45 AM	Wastewater	Effluent (Holding pond 5,000 m3)	Aug 14, 2025	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)	Water Testing							
Total Dissolved Solids Dried at 180 degree C							mg/L	-	5	1510	≤3000	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C							mg/L	-	5	12	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of The Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Nattawut Abhonnoprommarat มีตราสารฯ 7-323-4-0006 , Thanassou Namakunna มีตราสารฯ 7-204-4-0101

Remark :

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- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management
Photchanas
Photchanas Seeda
Scientist (4)
มีตราสารฯ 7-323-4-0028
Approved by
Dej Changchon
Senior Manager
มีตราสารฯ 7-323-4-0001

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location:

TESTING
No.0009
Lot ID: 2566795
Date Received : Aug 14, 2025
Date Reported : Aug 21, 2025
Report Number : 3359409-2

Page 3 of 1

Sample Number 2566795-1
Sample Date Aug 14, 2025 10:45 AM
Sample Description Wastewater
Location Effluent (Holding pond 5,000 m3)
Date Analysis Commenced Aug 15, 2025
Condition of Sample Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.03	≤2.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Zinc	mg/L	0.003	0.005	0.34	≤5.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
Sampling By : Nattawat Abhomprommarat นวตวาท อภิพรหมมารัต , Thanassou Naimakunna นวตวาท นัยมาคุนนา ๖-204-a-0101

Remark :
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Technical Management
Savitree N.
Savitree Naisangiam
Manager
๖๕๕๐๒๒๖๗ ๖-204-a-0007

Approved by

Kanokkom Anek
Assistant General Manager
๖๕๕๐๒๒๖๗ ๖-204-a-0004

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Analysis / Test Report

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P/O :
Project Name : Environment : EIA
Project Location:

TESTING
No.0009
Lot ID: 2566795
Date Received : Aug 14, 2025
Date Reported : Aug 21, 2025
Report Number : 3359409-3

Page 1 of 1

Sample Number 2566795-1
Sample Date Aug 14, 2025 10:45 AM
Sample Description Wastewater
Location Effluent (Holding pond 5,000 m3)
Date Analysis Commenced Aug 14, 2025
Condition of Sample Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	1.82	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Water Testing							
Dissolved Oxygen *	mg/L	-	0.1	4.3	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (G)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
Sampling By : Nattawat Abhomprommarat นวตวาท อภิพรหมมารัต , Thanassou Naimakunna นวตวาท นัยมาคุนนา ๖-204-a-0101

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Approved by

Savitree N.
Savitree Naisangiam
Manager

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TESTING
No.0042

Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lai-Lok-Bankhai Road, Nong-Lai-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :
Date Received : Sep 22, 2025
Date Reported : Sep 29, 2025
Report Number : 3381048-1

Page 1 of 2

Sample Number 257575-1
Sampled Date Sep 22, 2025 10:30 AM
Sample Description Wastewater
Location Effluent (Holding pond 5,000 m3)
Date Analysis Commenced Sep 22, 2025
Condition of Sample Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	2.8	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	7	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	6	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	7.4	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	32.7	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1140	≤3000	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong

Technical Management

Photchanas

Photchanas Seeda
Scientist (A)
Wastduanarñ 7-323-4-0028

Approved by

D. J. J. J.

Dej Changchon
Senior Manager
Wastduanarñ 7-323-4-0001

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Analysis / Test Report

TESTING
No.0042

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lai-Lok-Bankhai Road, Nong-Lai-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :
Date Received : Sep 22, 2025
Date Reported : Sep 29, 2025
Report Number : 3381048-1

Page 2 of 2

Sample Number 257575-1
Sampled Date Sep 22, 2025 10:30 AM
Sample Description Wastewater
Location Effluent (Holding pond 5,000 m3)
Date Analysis Commenced Sep 22, 2025
Condition of Sample Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
Sampling By : Warunyo Chimphalee Wastduanarñ 7-323-4-0020, Smart Khumplee Wastduanarñ 7-204-4-0084

Remark :
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- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Photchanas

Photchanas Seeda
Scientist (A)
Wastduanarñ 7-323-4-0028

Approved by

D. J. J. J.

Dej Changchon
Senior Manager
Wastduanarñ 7-323-4-0001

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

TESTING

No.0009

Lot ID: 2575775

Date Received : Sep 22, 2025

Date Reported : Sep 23, 2025

Report Number : 3381046-2

Page 1 of 1

Sample Number	2575775-1
Sample Date	Sep 22, 2025 10:30 AM
Sample Description	Wastewater
Location	Effluent (Holding pond 5,000 m3)
Date Analysis Commenced	Sep 23, 2025
Condition of Sample	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.40	≤2.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B.3030 F	Bangkok
Zinc	mg/L	0.003	0.005	0.19	≤5.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B.3030 F	Bangkok

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Warinyoo Chimphalee รหัสประจำตัว 7-204-4-0020, Samart Khumplilee รหัสประจำตัว 7-204-4-0084

Remark :

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- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Savitree N.

Savitree Nosinglam
Manager

Approved by

Kanokorn Anek

Assistant General Manager
รหัสประจำตัว 7-204-4-0004

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

TESTING

No.0009

Lot ID: 2575775

Date Received : Sep 22, 2025

Date Reported : Sep 29, 2025

Report Number : 3381048-3

Page 1 of 1

Sample Number	2575775-1
Sample Date	Sep 22, 2025 10:30 AM
Sample Description	Wastewater
Location	Effluent (Holding pond 5,000 m3)
Date Analysis Commenced	Sep 22, 2025
Condition of Sample	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.26	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B.3030 F	Bangkok
Water Testing							
Conductivity at 25 Degree C	micromhos/cm	-	0.5	1588	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	4.4	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 1900-C (G)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Warinyoo Chimphalee , Samart Khumplilee

Remark :

- LOD : Limit of Detection
- "C" : Lower than LOQ (Unit of Quantitation) / LOR (Unit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Approved by

Savitree N.

Savitree Nosinglam
Manager

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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S:\Reports, AL, G, rpt (53194)



Analysis / Test Report

Client : Michalin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location:

TESTING
No.0042
Lot ID: 2584943
Date Received : Oct 21, 2025
Date Reported : Oct 29, 2025
Report Number : 3401391-1

Page 1 of 2

Sample Number	2584943-1
Sample Date	Oct 21, 2025 3:05 PM
Sample Description	Wastewater
Location	Effluent (Holding pond 5,000 m3)
Date Analysis Commenced	Oct 21, 2025
Condition of Sample	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Color (at Original pH)	ADHI	-	5	6	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADHI	-	5	5	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	7.1	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-CI (F)	Rayong
Temperature *	Degree C	-	-	32.9	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1192	≤3000	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong

Technical Management
Photchanas
Photchanas Seeda
Scientist (4)
โทรศัพท์ ๓-๓23-๓-0028

Approved by

D. Chongchon

Dej Chongchon
Senior Manager
โทรศัพท์ ๓-๓23-๓-0001

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2025-07-04 PM

S:\Report\Lab Report (43199)



Analysis / Test Report

Client : Michalin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location:

TESTING
No.0042
Lot ID: 2584943
Date Received : Oct 21, 2025
Date Reported : Oct 29, 2025
Report Number : 3401391-1

Page 2 of 2

Sample Number	2584943-1
Sample Date	Oct 21, 2025 3:05 PM
Sample Description	Wastewater
Location	Effluent (Holding pond 5,000 m3)
Date Analysis Commenced	Oct 21, 2025
Condition of Sample	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Waranyoo Chimphalee โทรศัพท์ ๓-๓23-๓-0020, Patchanon Inpruk โทรศัพท์ ๓-204-๓-0197

Remark :

- LOD : Limit of Detection
- <LQ : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * ignore not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management
Photchanas
Photchanas Seeda
Scientist (4)
โทรศัพท์ ๓-๓23-๓-0028

Approved by

D. Chongchon

Dej Chongchon
Senior Manager
โทรศัพท์ ๓-๓23-๓-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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2025-07-04 PM

S:\Report\Lab Report (43199)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

Page 1 of 1

Sample Number	2584943-1
Sampled Date	Oct 21, 2025 3:05 PM
Sample Description	Wastewater
Location	Effluent (Holding pond 5,000 m3)
Date Analysis Commenced	Oct 21, 2025
Condition of Sample	Contained in one amber glass bottle and four plastic bottles; sample containers comply to pretreatment - preservation standards (APHA 1159A).

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.20	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B.3030 F.	Bangkok
Water Testing							
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	1594	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF,	Rayong

Dissolved Oxygen *	mg/L	-	0.1	4.4	No Standard	Standard Methods for the Examination of Water and	Rayong
--------------------	------	---	-----	-----	-------------	---	--------

Guideline : Effluent standard for factories, industrial estate and industrial effluent treatment plant
Sampling By : Wanyuoyi Chimphalee , Patchanon Inpruk

Remark :

- LOD : Limit of Detection
- LQR : Limit of Quantitation / LQR (Limit of Reporting)
- * : Lower than LQR (Units of Quantitation)
- Analytical method used : * (are not included in scope of Accreditation ISO/IEC 17025)
- Analytical method not included in scope of accreditation ISO/IEC 17025

Finally apply to the sample(s) as submitted, unless the sampler was contacted by ALN. The report shall not be released until the results are approved by the laboratory.

Approved by _____

Chamatt L.

Chamattagam Inchom
Section Head

0 2766 55 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand
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Analysis / Test Report

TESTING
No.0042
Lot ID: 2596184
Date Received : Nov 14, 2025
Date Reported : Nov 21, 2025
Report Number : 3428682-1

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-La-Lok-Bankhai Road, Nong-La-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :

Page 1 of 2

Sample Number	2596184-1
Sampled Date	Nov 14, 2025 9:28 AM
Sample Description	Wastewater
Location	Effluent (Holding pond 5,000 m3)
Date Analysis Commenced	Nov 14, 2025
Condition of Sample	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	2.8	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	6	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	5	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C		-	-	7.7	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Rayong
Temperature *	Degree C	-	-	32.4	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	984	≤3000	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong

Technical Management

Photchanas

Photchanas Seeda
Scientist (4)
วสตูมวณร 7-323-0-0028

Approved by

D. J. J. J.

Dej Changchon
Senior Manager
วสตูมวณร 7-323-0-0001

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Analysis / Test Report

TESTING
No.0042
Lot ID: 2596184
Date Received : Nov 14, 2025
Date Reported : Nov 21, 2025
Report Number : 3428682-1

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-La-Lok-Bankhai Road, Nong-La-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :

Page 2 of 2

Sample Number	2596184-1
Sampled Date	Nov 14, 2025 9:28 AM
Sample Description	Wastewater
Location	Effluent (Holding pond 5,000 m3)
Date Analysis Commenced	Nov 14, 2025
Condition of Sample	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Suphanat Sakulkitmasak วสตูมวณร 7-323-0-0021, Patchanon Inprirk วสตูมวณร 7-204-0-0197

Remark :
- LOD : Limit of Detection
- <C : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyzed marked * : Sample not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Photchanas

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Scientist (4)
วสตูมวณร 7-323-0-0028

Approved by

D. J. J. J.

Dej Changchon
Senior Manager
วสตูมวณร 7-323-0-0001

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lai-Lok-Bankhai Road, Nong-Lai-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :
TESTING
No.0009
Lot ID: 2596184
Date Received : Nov 14, 2025
Date Reported : Nov 21, 2025
Report Number : 3428582-2

Page 1 of 1

Sample Number	2596184-1
Sampled Date	Nov 14, 2025 9:28 AM
Sample Description	Wastewater
Location	Effluent (Holding pond 5,000 m3)
Date Analysis Commenced	Nov 17, 2025
Condition of Sample	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.02	≤2.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B.3030 F	Bangkok
Zinc	mg/L	0.003	0.005	0.16	≤5.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B.3030 F	Bangkok

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Suphanat Sakulkitmasak รหัสประจำตัว 7-323-4-0021, Patchanon Inpruk รหัสประจำตัว 7-204-4-0157

Remarks :
1. LOD : Limit of Detection
2. <C< : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
3. Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
4. Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Chanatt L.

Chanattagarn Inchoom
Section Head
รหัสประจำตัว 7-204-4-0008

Approved by

Kanokorn Anek

Assistant General Manager
รหัสประจำตัว 7-204-4-0004

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lai-Lok-Bankhai Road, Nong-Lai-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :
TESTING
No.0009
Lot ID: 2596184
Date Received : Nov 14, 2025
Date Reported : Nov 21, 2025
Report Number : 3428582-3

Page 1 of 3

Sample Number	2596184-1
Sampled Date	Nov 14, 2025 9:28 AM
Sample Description	Wastewater
Location	Effluent (Holding pond 5,000 m3)
Date Analysis Commenced	Nov 14, 2025
Condition of Sample	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.34	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B.3030 F	Bangkok
Water Testing							
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	1359	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	4.2	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (G)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Suphanat Sakulkitmasak , Patchanon Inpruk

Remarks :
1. LOD : Limit of Detection
2. <C< : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
3. Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
4. Sampling is not included in scope of accreditation ISO/IEC 17025

Approved by

Chanatt L.

Chanattagarn Inchoom
Section Head

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of this laboratory.

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2292-02/ENGL

5/Report_AU_01-01 (6/2019)



TESTING
No.0042
Lot ID: 25105354

Date Received : Dec 12, 2025
Date Reported : Dec 19, 2025
Report Number : 3452029-1

Page 1 of 2

Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lok-Bankhal Road, Nong-Lok, Bankhal, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location:

Sample Number		25105354-1					
Sample Date		Dec 12, 2025 9:40 AM					
Sample Description		Wastewater					
Location		Effluent (Holding pond 5,000 m3)					
Date Analysis Commenced		Dec 12, 2025					
Condition of Sample		Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	5.0	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	29	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	9	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	7	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C		-	-	8.0	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-CI (F)	Rayong
Temperature *	Degree C	-	-	28.3	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1360	≤3000	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong

Technical Management
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Photchanas Seeda
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Approved by

Dej Changchon
Senior Manager
wtid@alsglobal.com 7-323-a-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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2572-627 (ENH)

2572-627 (ENH)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lok-Bankhal Road, Nong-Lok, Bankhal, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location:

Sample Number	25105354-1						
Sampled Date	Dec 12, 2025 9:40 AM						
Sample Description	Wastewater						
Location	Effluent (Holding pond 5,000 m3)						
Date Analysis Commenced	Dec 12, 2025						
Condition of Sample	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	12	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
Sampling By : Wanuyoo Chimphalee wtid@alsglobal.com 7-323-a-0020, Patchanon Inpink wtid@alsglobal.com 7-204-a-0197

Remark :
- LOD : Limit of Detection
- 'C' : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management
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Approved by

Dej Changchon
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2572-627 (ENH)

2572-627 (ENH)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :
TESTING
No.0009
Lot ID: 25105354
Date Received : Dec 12, 2025
Date Reported : Dec 19, 2025
Report Number : 3452029-2

Page 1 of 1

Sample Number	25105354-1
Sampled Date	Dec 12, 2025 9:40 AM
Sample Description	Wastewater
Location	Effluent (Holding pond 5,000 m3)
Date Analysis Commenced	Dec 13, 2025
Condition of Sample	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/L	0.0003	0.0005	0.03	≤2.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B.3030 F	Bangkok
Zinc	mg/L	0.003	0.005	0.06	≤5.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B.3030 F	Bangkok

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Warinyoo Chimphalee รหัสประจำตัว 7-323-4-0020 , Patchanon Inpruk รหัสประจำตัว 7-204-4-0197

Remark :
- LOD : Limit of Detection
- LOR : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * before not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Sawitree N.
Sawitree Naisangiam
Manager
รหัสประจำตัว 7-204-4-0007

Approved by

Kanokkorn Anek
Assistant General Manager
รหัสประจำตัว 7-204-4-0004

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :
TESTING
No.0009
Lot ID: 25105354
Date Received : Dec 12, 2025
Date Reported : Dec 19, 2025
Report Number : 3452029-3

Page 1 of 1

Sample Number	25105354-1
Sampled Date	Dec 12, 2025 9:40 AM
Sample Description	Wastewater
Location	Effluent (Holding pond 5,000 m3)
Date Analysis Commenced	Dec 12, 2025
Condition of Sample	Contained in one amber glass bottle and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.32	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B.3030 F	Bangkok
Water Testing							
Conductivity at 25 Degree C *	micromhos/cm *		0.5	1659	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Dissolved Oxygen *	mg/L		0.1	3.3	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (G)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Warinyoo Chimphalee รหัสประจำตัว 7-323-4-0020 , Patchanon Inpruk รหัสประจำตัว 7-204-4-0197

Remark :
- LOD : Limit of Detection
- LOR : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * before not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Approved by

Sawitree N.
Sawitree Naisangiam
Manager

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คุณภาพดิน



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-La-Lok-Bankhai Road, Nong-La-Lok, Bankhai, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location:

Lot ID: 2575782

Date Received : Sep 22, 2025

Date Reported : Oct 01, 2025

Report Number : 3418354-1

Page 1 of 2

Sample Number	2575782-1
Sampled Date	Sep 22, 2025 9:15 AM
Sample Description	Soil
Location	S1 หน้าห้องครัว 1
Date Analysis Commenced	Sep 23, 2025
Condition of Sample	Packed in one plastic bag, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/kg	-	1.00	5.86	No Standard	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok
Iron	mg/kg	-	1.00	8045	No Standard	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok
Zinc	mg/kg	-	1.00	12.2	1000	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

Note : Analysis Results expressed on dry basis.

Sampling By : Patchanon Inpruk วาตมูลณี 7-204-0-0197

Remark :

LOD : Limit of Detection
LOQ : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Technical Management

Savitree N.
Savitree Nisangam
Manager
วาตมูลณี 7-204-0-0007

Approved by

Kanokorn Anek
Kanokorn Anek
Assistant General Manager
วาตมูลณี 7-204-0-0004

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2575-02/ENGL

NIGHT SOLUTIONS THAILAND PANYATHEP

81 (Banyo) Ltd Co., Ltd. (2-0199)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-La-Lok-Bankhai Road, Nong-La-Lok, Bankhai, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location:

Lot ID: 2575782

Date Received : Sep 22, 2025

Date Reported : Oct 01, 2025

Report Number : 3418354-2

Page 1 of 1

Sample Number	2575782-1
Sampled Date	Sep 22, 2025 9:15 AM
Sample Description	Soil
Location	S1 หน้าห้องครัว 1
Date Analysis Commenced	Sep 24, 2025
Condition of Sample	Packed in one plastic bag, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Physical Parameters							
Moisture	%	-	0.1	10.3	No Standard	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 G	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

Note : Analysis Results expressed on dry basis.

Sampling By : Patchanon Inpruk

Remark :

LOD : Limit of Detection
LOQ : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

Siriluk P.
Siriluk Bunrak
Section Head

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2575-02/ENGL

81 (Banyo) Ltd Co., Ltd. (2-0199)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :
Lot ID: 2575782
Date Received : Sep 22, 2025
Date Reported : Oct 01, 2025
Report Number : 3418356-1

Page 1 of 1

Sample Number 2575782-3
Sample Date Sep 22, 2025 9:20 AM
Sample Description Soil
Location SI ๔๓๓๓ 30 ๓๔๓๓๓ ๔๓๓๓๓ 1
Date Analysis Commenced Sep 23, 2025
Condition of Sample Packed in one plastic bag, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/kg	-	1.00	12.1	No Standard	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok
Iron	mg/kg	-	1.00	7941	No Standard	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok
Zinc	mg/kg	-	1.00	21.8	1000	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

Note : Analysis Results expressed on dry basis.

Sampling By : Patchanon Inpruk ๓๔๓๓๓๓ ๓-๒04-๔-0197

Remark :
LOD : Limit of Detection
LOQ : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Technical Management
Savitree N.
Savitree Nolsangiam
Manager
๓๔๓๓๓๓ ๓-๒04-๔-0007
Approved by
Kanokkorn Anek
Assistant General Manager
๓๔๓๓๓๓ ๓-๒04-๔-0004

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Analysis / Test Report

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129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location :
Lot ID: 2575782
Date Received : Sep 22, 2025
Date Reported : Oct 01, 2025
Report Number : 3418356-2

Page 1 of 1

Sample Number 2575782-3
Sample Date Sep 22, 2025 9:20 AM
Sample Description Soil
Location SI ๔๓๓๓ 30 ๓๔๓๓๓ ๔๓๓๓๓ 1
Date Analysis Commenced Sep 24, 2025
Condition of Sample Packed in one plastic bag, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Physical Parameters							
Moisture	%	-	0.1	12.0	No Standard	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540-G	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

Note : Analysis Results expressed on dry basis.

Sampling By : Patchanon Inpruk

Remark :
LOD : Limit of Detection
LOQ : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by
Siriulok P.
Siriulok Bumak
Section Head

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lai-Lok-Bankhai Road, Nong-Lai-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location:

Lot ID: 2575782

Date Received : Sep 22, 2025
Date Reported : Oct 01, 2025
Report Number : 3418358-1

Page 1 of 1

Sample Number 2575782-5
Sampled Date Sep 22, 2025 9:35 AM
Sample Description Soil
Location S2 พื้นที่ ๕๓๗๗/1
Date Analysis Commenced Sep 23, 2025
Condition of Sample Packed in one plastic bag, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/kg	-	1.00	6.62	No Standard	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok
Iron	mg/kg	-	1.00	10002	No Standard	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok
Zinc	mg/kg	-	1.00	10.9	1000	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

Note : Analysis Results expressed on dry basis.

Sampling By : Pachchan Inpink มาตฐานาพร ๗-204-๓-0197

Remark :

- LOD : Limit of Detection
- LOQ : Lower than LOD (Limit of Quantitation) / LOR (Limit of Reporting)

Technical Management

Savitree N.
Savitree Nongsiam
Manager
มาตฐานาพร ๗-204-๓-0007

Approved by

Kanokorn Anek
Assistant General Manager
มาตฐานาพร ๗-204-๓-0004

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2575782 (PMM)

S: Report_ML_01 (12.10.19)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lai-Lok-Bankhai Road, Nong-Lai-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Project Location:

Lot ID: 2575782

Date Received : Sep 22, 2025
Date Reported : Oct 01, 2025
Report Number : 3418358-2

Page 1 of 1

Sample Number 2575782-5
Sampled Date Sep 22, 2025 9:35 AM
Sample Description Soil
Location S2 พื้นที่ ๕๓๗๗/1
Date Analysis Commenced Sep 24, 2025
Condition of Sample Packed in one plastic bag, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Physical Parameters							
Moisture	%	-	0.1	9.7	No Standard	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 G	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

Note : Analysis Results expressed on dry basis.

Sampling By : Pachchan Inpink

Remark :

- LOD : Limit of Detection
- LOQ : Lower than LOD (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

Siriluk P.
Siriluk Bunmak
Section Head

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2575782 (PMM)

S: Report_ML_01 (12.10.19)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 2575782

Date Received : Sep 22, 2025

Date Reported : Oct 01, 2025

Report Number : 3418360-1

Page 1 of 1

Sample Number 2575782-7
Sampled Date Sep 22, 2025 9:40 AM
Sample Description Soil
Location S2 หน้าดิน 30 เมตรจากอาคาร 1
Date Analysis Commenced Sep 23, 2025
Condition of Sample Packed in one plastic bag, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/kg	-	1.00	4.82	No Standard	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok
Iron	mg/kg	-	1.00	7972	No Standard	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok
Zinc	mg/kg	-	1.00	5.27	1000	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

Note : Analysis Results expressed on dry basis.

Sampling By : Patchanon Inprirk วาดินธุระวารี 1-204-3-0197

Remark :
LOD : Limit of Detection
LOQ : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Technical Management

Savitree N.
Savitree Nolsangiam
Manager
วาดินธุระวารี 1-204-3-0007

Approved by

Kanokorn Anek
Assistant General Manager
วาดินธุระวารี 1-204-3-0004

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 2575782

Date Received : Sep 22, 2025

Date Reported : Oct 01, 2025

Report Number : 3418360-2

Page 1 of 1

Sample Number 2575782-7
Sampled Date Sep 22, 2025 9:40 AM
Sample Description Soil
Location S2 หน้าดิน 30 เมตรจากอาคาร 1
Date Analysis Commenced Sep 24, 2025
Condition of Sample Packed in one plastic bag, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Physical Parameters							
Moisture	%	-	0.1	9.9	No Standard	In-house method based on Standard Method for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540-G	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

Note : Analysis Results expressed on dry basis.

Sampling By : Patchanon Inprirk

Remark :
LOD : Limit of Detection
LOQ : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

Siriluk P.
Siriluk Bunrak
Section Head

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand 21120

P/O :

Date Received : Sep 22, 2025

Project Name : Environment : EIA

Date Reported : Oct 01, 2025

Project Location:

Report Number : 3418362-1

Page 1 of 2

Lot ID: 2575782

Date Received : Sep 22, 2025

Date Reported : Oct 01, 2025

Report Number : 3418362-1

Project Location:

Page 1 of 2

Sample Number 2575782-9

Sampled Date Sep 22, 2025 10:00 AM

Sample Description Soil

Location S3 หน้าดินด้านซ้าย 1

Date Analysis Commenced Sep 23, 2025

Condition of Sample Packed in one plastic bag, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing						
Copper	mg/kg	1.00	38.1	No Standard	United States Environmental Protection Agency, EPA Method 3050 B and 8010 D	Bangkok
Iron	mg/kg	1.00	10608	No Standard	United States Environmental Protection Agency, EPA Method 3050 B and 8010 D	Bangkok
Zinc	mg/kg	1.00	126	1000	United States Environmental Protection Agency, EPA Method 3050 B and 8010 D	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

Note : Analysis Results expressed on dry basis.

Sampling By : Patchanan Inpruk รหัสประจำตัว 7-204-3-0197

Remark : LOD : Limit of Detection

LOQ : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

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LOQ : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand 21120

P/O :

Date Received : Sep 22, 2025

Project Name : Environment : EIA

Date Reported : Oct 01, 2025

Project Location:

Report Number : 3418362-2

Page 1 of 1

Lot ID: 2575782

Date Received : Sep 22, 2025

Date Reported : Oct 01, 2025

Report Number : 3418362-2

Project Location:

Sample Number 2575782-9

Sampled Date Sep 22, 2025 10:00 AM

Sample Description Soil

Location S3 หน้าดินด้านซ้าย 1

Date Analysis Commenced Sep 24, 2025

Condition of Sample Packed in one plastic bag, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Physical Parameters						
Moisture	%	0.1	14.0	No Standard	In-house method based on Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 24th ed., 2023, part 2540 G	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

Note : Analysis Results expressed on dry basis.

Sampling By : Patchanan Inpruk

Remark : LOD : Limit of Detection

LOQ : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

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LOQ : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Report Number : 3418364-1
Project Location:

Lot ID: 2575782
Date Received : Sep 22, 2025
Date Reported : Oct 01, 2025
Report Number : 3418364-1

Page 1 of 1

Sample Number 2575782-11
Sample Date Sep 22, 2025 10:05 AM
Sample Description Soil
Location S3 ครัวเรือน 30 ไร่ บ้านเลขที่ 1
Date Analysis Commenced Sep 23, 2025
Condition of Sample Packed in one plastic bag, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Copper	mg/kg	-	1.00	7.05	No Standard	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok
Iron	mg/kg	-	1.00	12239	No Standard	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok
Zinc	mg/kg	-	1.00	15.8	1000	United States Environmental Protection Agency, EPA Method 3050 B and 6010 D	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

Note : Analysis Results expressed on dry basis.

Sampling By : Patchanon Inpruk wistduanawit 7-204-7-0197

Remark :
- LOD : Limit of Detection
- "c" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Technical Management

Savitree N.
Savitree Nolsangiam
Manager
wistduanawit 7-204-7-0007

Approved by

Kanokorn Anek
Assistant General Manager
wistduanawit 7-204-7-0004

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2025-02/1040

Silhouette_ALS per (30994)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120
P/O :
Project Name : Environment : EIA
Report Number : 3418364-2
Project Location:

Lot ID: 2575782
Date Received : Sep 22, 2025
Date Reported : Oct 01, 2025
Report Number : 3418364-2

Page 1 of 1

Sample Number 2575782-11
Sample Date Sep 22, 2025 10:05 AM
Sample Description Soil
Location S3 ครัวเรือน 30 ไร่ บ้านเลขที่ 1
Date Analysis Commenced Sep 24, 2025
Condition of Sample Packed in one plastic bag, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Physical Parameters							
Moisture	%	-	0.1	11.6	No Standard	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 G	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

Note : Analysis Results expressed on dry basis.

Sampling By : Patchanon Inpruk

Remark :
- LOD : Limit of Detection
- "c" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

Siriluk P.
Siriluk Bunrak
Section Head

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2025-02/1040

Silhouette_ALS per (43294)

ภาคผนวก ค-6

ระดับความร้อนในสถานที่ทำงาน



Analysis / Test Report

Client: Michelin Slam Co., Ltd.

129 Moo 3, Nong-Lak-Lok-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand

P/O :

Project Name : Environment : EIA

Project Location

Lot ID: 2571522

Date Received : Aug 14, 2025

Date Reported : Aug 20, 2025

Report Number: 3370329-1

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Page 2 of 6

Sample Number	2571522-2
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date	Aug 14, 2025
Measurement by	Chanon Booncheun
Location	นิคมอุตสาหกรรม 1 จังหวัด (55-11-11-11) : - : -

Location	Duration (min)	WBG ^a (°C)	NWB (°C)	GT (°C)	DB (°C)
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การวัด	ค่าเฉลี่ย	ค่าเบี่ยงเบนมาตรฐาน	ค่าสูงสุด	ค่าต่ำสุด
การวัดที่ 1	30.0	28.7	33.0	32.9

Average (WBG)	Average (WBG)
30.0	34.0
34.0	34.0

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E. 2559

Technical Management

Sept 5.

Supot Salamteh
Section Head

Approved by _____

Wichan Choonharat
Wichan Choonharat
Assistant Manager

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E. Vignard, A. Humez / J. Macroeconomics 24 (2002) 247-269

5:1 (Reports) Air Mail Vol 1 1937A)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120

P/O :
Project Name : Environment : EIA
Project Location :

Lot ID: 2571522

Date Received : Aug 14, 2025
Date Reported : Aug 20, 2025
Report Number: 3370329-1

Page 3 of 6

Sample Number	2571522-3				
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)				
Measurement Date	Aug 14, 2025				
Measurement by	Chanoj Booncheun				
Location	บริเวณงาน 1 หลัง (ด้านหลังอาคาร หอสมุดเก่า) : - บนถนน : -)				
Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณพื้นที่จอดรถ (H3)	120	28.9	26.0	35.7	35.4
	Average (WBGT)	28.9			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

Technical Management

Supt S.

Supot Salameh
Section Head

Approved by

Wichan Choonharat

Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120

P/O :
Project Name : Environment : EIA
Project Location :

Lot ID: 2571522

Date Received : Aug 14, 2025
Date Reported : Aug 20, 2025
Report Number: 3370329-1

Page 4 of 6

Sample Number	2571522-4				
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)				
Measurement Date	Aug 14, 2025				
Measurement by	Chaiton Booncheun				
Location	บริเวณงาน 1 หลัง (ด้านหลังอาคาร บริเวณลานจอดรถ : - บนถนน : -)				
Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณพื้นที่จอดรถบนถนน (H4)	120	24.9	23.2	28.8	28.7
Average (WBGT)		24.9			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

Technical Management

Supt S.

Supot Salameh
Section Head

Approved by

Wichan Choonharat

Wichan Choonharat
Assistant Manager

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3 Reports per hour per 1.15PM



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lai-Lok-Bankhai Road, Nong-Lai-Lok, Bankhai, Rayong Thailand

21120

P/O : Environment : EIA

Project Name :

Project Location :

Lot ID: 2571522

Date Received : Aug 14, 2025

Date Reported : Aug 20, 2025

Report Number: 3370329-1

Page 5 of 6

Sample Number	2571522-5
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date	Aug 14, 2025
Measurement by	Chanon Booncheun
Location	บริเวณงาน 1 หลัง (วัดอุณหภูมิร่างกาย : - แทน : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณที่พักผ่อนกลางแจ้ง (HS)	120	24.7	22.4	30.0	29.8
Average (WBST)		24.7			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment relation to Heat, Light and Noise, B.E.2559

Technical Management

Supt S.

Supot Salameeh
Section Head

Approved by

Wichan Choonharat

Wichan Choonharat
Assistant Manager

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0 (Vientiane) 010-444444 / 1 (DMS)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lai-Lok-Bankhai Road, Nong-Lai-Lok, Bankhai, Rayong Thailand

21120

P/O : Environment : EIA

Project Name :

Project Location :

Lot ID: 2571522

Date Received : Aug 14, 2025

Date Reported : Aug 20, 2025

Report Number: 3370329-1

Page 6 of 6

Sample Number	2571522-6
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date	Aug 14, 2025
Measurement by	Chanon Booncheun
Location	บริเวณงาน 1 หลัง (วัดอุณหภูมิร่างกาย : - แทน : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณที่พักผ่อนกลางแจ้ง (HS)	120	23.4	21.1	28.7	28.5
Average (WBST)		23.4			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment relation to Heat, Light and Noise, B.E.2559

Technical Management

Supt S.

Supot Salameeh
Section Head

Approved by

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2272-62 / EMAIL

0 (Vientiane) 010-444444 / 1 (DMS)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lok-Bankhai Road, Nong-Lok, Bankhai, Rayong Thailand
21120
P/O :
Project Name : Environment : EIA
Project Location :

Lot ID: 25101097
Date Received : Nov 07, 2025
Date Reported : Nov 13, 2025
Report Number: 3440729-1

Page 1 of 6

Sample Number 25101097-1
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Nov 06, 2025
Measurement by Annat Wongsakhen
Location บริเวณงาน 1 หลัง (ด้านหน้าของอาคาร : - ภายใน : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณงาน 1 หลัง (ด้านหน้าของอาคาร (H1))	120	31.5	28.2	39.2	39.1
Average (WBGT)		31.5			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

Technical Management

Supt S.
Supt. Salambh
Section Head

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3. Report: Air Quality (11-2024)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lok-Bankhai Road, Nong-Lok, Bankhai, Rayong Thailand
21120
P/O :
Project Name : Environment : EIA
Project Location :

Lot ID: 25101097
Date Received : Nov 07, 2025
Date Reported : Nov 13, 2025
Report Number: 3440729-1

Page 2 of 6

Sample Number 25101097-2
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Nov 06, 2025
Measurement by Annat Wongsakhen
Location บริเวณงาน 1 หลัง (ด้านหน้าของอาคาร : - ภายใน : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณงาน 1 หลัง (ด้านหน้าของอาคาร (H2))	120	26.3	24.1	31.4	31.3
Average (WBGT)		26.3			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

Technical Management

Supt S.
Supt. Salambh
Section Head

Approved by

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272242 / EMAIL

3. Report: Air Quality (11-2024)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lai-Lok-Bankhai Road, Nong-Lai-Lok, Bankhai, Rayong Thailand

21120

P/O : : Environment : EIA

Project Name : : Environment : EIA

Project Location : : Environment : EIA

Lot ID: 25101097

Date Received : Nov 07, 2025

Date Reported : Nov 13, 2025

Report Number: 3440729-1

Page 3 of 6

Sample Number	25101097-3
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date	Nov 06, 2025
Measurement by	Annat Wongsakhen
Location	พื้นที่งาน 1 หลัง (ด้านหน้าอาคาร) : - แยก : -

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
พื้นที่งาน 1 หลัง (H3)	120	25.9	23.4	31.8	31.6
Average (WBGT)		25.9			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

Technical Management

Supt S.

Supot Salameeh
Section Head

Approved by

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2272-52 / EMAIL

3 Waporn_Jaroonprap (11.51AM)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lai-Lok-Bankhai Road, Nong-Lai-Lok, Bankhai, Rayong Thailand

21120

P/O : : Environment : EIA

Project Name : : Environment : EIA

Project Location : : Environment : EIA

Lot ID: 25101097

Date Received : Nov 07, 2025

Date Reported : Nov 13, 2025

Report Number: 3440729-1

Page 4 of 6

Sample Number	25101097-4
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date	Nov 06, 2025
Measurement by	Annat Wongsakhen
Location	พื้นที่งาน 1 หลัง (ด้านหน้าอาคาร) : - แยก : -

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
พื้นที่งาน 1 หลัง (H4)	120	25.2	23.4	29.4	29.3
Average (WBGT)		25.2			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

Technical Management

Supt S.

Supot Salameeh
Section Head

Approved by

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Wichan Choonharat
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3 Waporn_Jaroonprap (11.51AM)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 25101097

Date Received : Nov 07, 2025

Date Reported : Nov 13, 2025

Report Number: 3440729-1

Page 5 of 6

Sample Number	25101097-5
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date	Nov 06, 2025
Measurement by	Amnat Wongsakthen
Location	บริเวณด้าน 1 หลัง (ด้านหลังอาคาร) : - นอก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณพื้นที่วัดอุณหภูมิ (H5)	120	24.2	22.0	29.4	29.3
Average (WBGT)		24.2			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

- Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
- Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

Technical Management

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S. (Report)_Air Heat pr (11.51AM)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 25101097

Date Received : Nov 07, 2025

Date Reported : Nov 13, 2025

Report Number: 3440729-1

Page 6 of 6

Sample Number	25101097-6
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date	Nov 06, 2025
Measurement by	Amnat Wongsakthen
Location	บริเวณด้าน 1 หลัง (ด้านหลังอาคาร) : - นอก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณพื้นที่วัดอุณหภูมิ (H6)	120	25.0	23.2	29.2	29.1
Average (WBGT)		25.0			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

- Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
- Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

Technical Management

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S. (Report)_Air Heat pr (11.51AM)

ภาคผนวก ค-7

คุณภาพอากาศในสถานประกอบการ



Analysis / Test Report

TESTING
No.0042

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand
21120
P/O :
Project Name : Environment : EIA
Project Location :
Lot ID: 2571523
Date Received : Aug 14, 2025
Date Reported : Aug 21, 2025
Report Number : 3370330-1

Page 1 of 4

Sample Number	2571523-1							
Sampled Date	Aug 14, 2025							
Sample Description	Air Quality							
Location	พิกุลบูรณะ (F1)							
Date Analysis Commenced	Aug 19, 2025							
Condition of Sample	Drawn into one sorbent tube, refrigerated							
Barometric Pressure	748 mmHg							
Atmospheric Temperature	32.6 °C							
Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing								
Phosphoric acid *	09:00 AM - 05:00 PM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL Bangkok
Sulfuric acid *	09:00 AM - 05:00 PM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL Bangkok

Guideline :
MCL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2558 (2017)
Sampled By : Chaiton Boonchuan
Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.



Analysis / Test Report

TESTING
No.0042

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand
21120
P/O :
Project Name : Environment : EIA
Project Location :
Lot ID: 2571523
Date Received : Aug 14, 2025
Date Reported : Aug 21, 2025
Report Number : 3370330-1

Page 2 of 4

Sample Number:	2571523-2							
Sampled Date	Aug 14, 2025							
Sample Description	Air Quality							
Location	พิกุลบูรณะ (F2)							
Date Analysis Commenced	Aug 19, 2025							
Condition of Sample	Drawn into one sorbent tube, refrigerated							
Barometric Pressure	748 mmHg							
Atmospheric Temperature	32.6 °C							
Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline Testing Location
Air Testing								
Phosphoric acid *	09:00 AM - 05:00 PM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL Bangkok
Sulfuric acid *	09:00 AM - 05:00 PM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL Bangkok

Guideline :
MCL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2558 (2017)
Sampled By : Chaiton Boonchuan
Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This report shall not be reproduced except in full without the written approval of the laboratory.

Approved by

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327-63 (NMI)

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RIGHT SOLUTIONS HIGHLY PRECISE

327-63 (NMI)



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand
21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 2571523

Date Received : Aug 14, 2025
Date Reported : Aug 21, 2025
Report Number : 3370330-1

TESTING
No.0042

Page 3 of 4

Sample Number	2571523-3
Sample Date	Aug 14, 2025
Sample Description	Air Quality
Location	พื้นที่สาธารณะ (D1)
Date Analysis Commenced	Aug 18, 2025
Condition of Sample	Drawn into two filter papers placed in each cassette
Barometric Pressure	748 mmHg
Atmospheric Temperature	32.6 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
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Air Testing									
Respirable Dust	09:00 AM - 05:00 PM	mg/m ³	-	0.15	<0.15	5	In-house method : STM 02-023 NIOSH Manual of Analytical Method 4th ed., NMAM, method 0600 Issue 3, 1998 (Include sampling)	OSHA	Rayong

Total Dust	09:00 AM - 05:00 PM	mg/m ³	-	0.15	<0.15	15	In-house method : STM 02-022 based on NIOSH Manual of Analytical Method, 4th ed., NMAM, method 0500 Issue 2, 1994 (Include sampling)	OSHA	Rayong
------------	---------------------	-------------------	---	------	-------	----	--	------	--------

Guideline :

OSHA : Occupational Safety and Health Administration
Sampled By : Chanton Booncheun

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Thanitak.

Approved by

Thanita Kulsurwong
Scientist (4)

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3275-02/ENAL



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lak-Bankhai Road, Nong-Lak-Lok, Bankhai, Rayong Thailand
21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 2571523

Date Received : Aug 14, 2025
Date Reported : Aug 21, 2025
Report Number : 3370330-1

TESTING
No.0042

Page 4 of 4

Sample Number	2571523-4
Sample Date	Aug 14, 2025
Sample Description	Air Quality
Location	พื้นที่สาธารณะ (D2)
Date Analysis Commenced	Aug 18, 2025
Condition of Sample	Drawn into two filter papers placed in each cassette
Barometric Pressure	748 mmHg
Atmospheric Temperature	32.6 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
---------	-------------------	------	-----	-----------	--------	-----------------	--------	-----------	------------------

Air Testing									
Respirable Dust	09:00 AM - 05:00 PM	mg/m ³	-	0.15	<0.15	5	In-house method : STM 02-023 NIOSH Manual of Analytical Method 4th ed., NMAM, method 0600 Issue 3, 1998 (Include sampling)	OSHA	Rayong

Total Dust	09:00 AM - 05:00 PM	mg/m ³	-	0.15	<0.15	15	In-house method : STM 02-022 based on NIOSH Manual of Analytical Method, 4th ed., NMAM, method 0500 Issue 2, 1994 (Include sampling)	OSHA	Rayong
------------	---------------------	-------------------	---	------	-------	----	--	------	--------

Guideline :

OSHA : Occupational Safety and Health Administration
Sampled By : Chanton Booncheun

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Thanitak.

Approved by

Thanita Kulsurwong
Scientist (4)

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3275-02/ENAL



Analysis / Test Report

TESTING
No.0042

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhal Road, Nong-Lak-Lok, Bankhal, Rayong Thailand
21120
P/O :
Project Name : Environment : EIA
Project Location :
Lot ID: 25101099
Date Received : Nov 07, 2025
Date Reported : Nov 14, 2025
Report Number : 3440731-1

Page 1 of 4

Sample Number	Sampled Date/Time	Unit	LOQ (LOR)	Result	Guideline Limit	Method	Testing Location
25101099-1	Nov 06, 2025						
Sample Description	Air Quality						
Location	ฟาร์มสุรา (F1)						
Date Analysis Commenced	Nov 11, 2025						
Condition of Sample	Drawn into one sorbent tube, refrigerated						
Barometric Pressure	755 mmHg						
Atmospheric Temperature	31.4 °C						
Analyte	Sampled Date/Time	Unit	LOQ (LOR)	Result	Guideline Limit	Method	Testing Location
Air Testing							
Phosphoric acid *	09:00 AM - 05:00 PM	mg/m3	0.05	<0.05	1	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	09:00 AM - 05:00 PM	mg/m3	0.05	<0.05	1	Based on OSHA, ID-174-SG	Bangkok

Guideline :
MCL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
Sampled By : Annat Wongsakhan
Remark :
: LOD : Limit of Detection
: "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
: Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Tharitat.

Approved by

Tharita Kulsurhong
Scientist (4)

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Analysis / Test Report

TESTING
No.0042

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-Lak-Bankhal Road, Nong-Lak-Lok, Bankhal, Rayong Thailand
21120
P/O :
Project Name : Environment : EIA
Project Location :
Lot ID: 25101099
Date Received : Nov 07, 2025
Date Reported : Nov 14, 2025
Report Number : 3440731-1

Page 2 of 4

Sample Number	Sampled Date/Time	Unit	LOQ (LOR)	Result	Guideline Limit	Method	Testing Location
25101099-2	Nov 06, 2025						
Sample Description	Air Quality						
Location	ฟาร์มสุรา (F2)						
Date Analysis Commenced	Nov 11, 2025						
Condition of Sample	Drawn into one sorbent tube, refrigerated						
Barometric Pressure	755 mmHg						
Atmospheric Temperature	31.4 °C						
Analyte	Sampled Date/Time	Unit	LOQ (LOR)	Result	Guideline Limit	Method	Testing Location
Air Testing							
Phosphoric acid *	09:00 AM - 05:00 PM	mg/m3	0.05	<0.05	1	Based on OSHA, ID-174-SG	Bangkok
Sulfuric acid *	09:00 AM - 05:00 PM	mg/m3	0.05	<0.05	1	Based on OSHA, ID-174-SG	Bangkok

Guideline :
MCL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
Sampled By : Annat Wongsakhan
Remark :
: LOD : Limit of Detection
: "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
: Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Tharitat.

Approved by

Tharita Kulsurhong
Scientist (4)

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2077-62 DML



Analysis / Test Report

Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand
21120

P/O : 21120

Project Name : Environment : EIA

Project Location :

Lot ID: 25101099

Date Received : Nov 07, 2025

Date Reported : Nov 14, 2025

Report Number : 3440731-1

TESTING
No.0042

TESTING
No.0042

Lot ID: 25101099

Date Received : Nov 07, 2025

Date Reported : Nov 14, 2025

Report Number : 3440731-1

Page 3 of 4

Page 4 of 4

Sample Number 25101099-3
Sampled Date Nov 06, 2025
Sample Description Air Quality
Location Huaydang (D1)
Date Analysis Commenced Nov 12, 2025
Condition of Sample Drawn into two filter papers placed in plastic cassette
Barometric Pressure 755 mmHg
Atmospheric Temperature 31.4 °C

Sample Number 25101099-4
Sampled Date Nov 06, 2025
Sample Description Air Quality
Location Huaydang (D2)
Date Analysis Commenced Nov 12, 2025
Condition of Sample Drawn into two filter papers placed in plastic cassette
Barometric Pressure 755 mmHg
Atmospheric Temperature 31.4 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
---------	-------------------	------	-----	-----------	--------	-----------------	--------	-----------	------------------

Air Testing

Respirable Dust 09:00 AM - 05:00 PM mg/m³ - 0.15 <0.15 5 In-house method : STM 02-023 NIOSH Manual of Analytical Method 4th ed., NMAM, method 0600 Issue 3, 1998 (Include sampling)

Total Dust 09:00 AM - 05:00 PM mg/m³ - 0.15 0.61 15 In-house method : STM 02-022 based on NIOSH Manual of Analytical Method, 4th ed., NMAM, method 0500 Issue 2, 1994 (Include sampling)

Guideline :

OSHA : Occupational Safety and Health Administration

Sampled By : Annat Wongsakhen

Remark :

- LOD : Limit of Detection
- <"<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Thanitak.

Approved by

Thanita Kulsurwong
Scientist (4)

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Thanitak.

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Thanita Kulsurwong
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ภาคผนวก ค-8

ระดับเสียงในสถานที่ทำงาน



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

Client : Michelin Siam Co., Ltd.
129 Moo 3, Nong-La-Lok-Bankhai Road, Nong-La-Lok, Bankhai, Rayong Thailand 21120

: 0/d

Project Name : Environment : EIA

Project Location ::

Lot ID: 2571524

Date Received : Aug 14, 2025

Date Reported : Aug 19, 2025

Report Number: 3385423-1

Page 1 of 1

Sample Number	2571524-2		
Parameter	Noise (Leq 8 hrs.)		
Location	หน้าอาคารโรงเรียนสุรวิทยาคาร (N4)		
Measurement Date	Aug 14, 2025		
Measurement by	Charon Boonchaleun		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:15 AM - 10:15 AM	82.2	91.8	80.8
10:15 AM - 11:15 AM	82.1	95.8	80.8
11:15 AM - 12:15 PM	82.1	92.9	81.0
12:15 PM - 01:15 PM	82.1	93.6	81.2
01:15 PM - 02:15 PM	83.1	96.4	81.0
02:15 PM - 03:15 PM	82.7	99.5	80.9
03:15 PM - 04:15 PM	82.8	99.4	79.8
04:15 PM - 05:15 PM	82.8	99.7	80.6

Leq Average 8 hrs. (dB(A))

 $L_{\max} \text{ (dB(A))}$

Standard (dB/A))

Reference Method - ISO 1996-1 : 2016

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย

ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ. ๒๕๔๖

Technical Management

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Anticha Subong

Approved by

1

Supot Salamitern

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Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 25101103

Date Received : Nov 07, 2025

Date Reported : Nov 13, 2025

Report Number: 3449843-1

Page 1 of 1

Sample Number	25101103-1			
Parameter	Noise (Leq 8 hrs.)			
Location	บริเวณเครื่องจักรและถนน (N3)			
Measurement Date	Nov 06, 2025			
Measurement by	Annat Wongsakthien			
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))	
09:23 AM - 10:23 AM	77.3	86.4	69.5	
10:23 AM - 11:23 AM	75.1	80.1	71.4	
11:23 AM - 12:23 PM	75.8	81.4	75.5	
12:23 PM - 01:23 PM	76.2	80.2	75.6	
01:23 PM - 02:23 PM	75.7	82.6	73.6	
02:23 PM - 03:23 PM	76.5	85.1	74.5	
03:23 PM - 04:23 PM	77.8	82.2	77.1	
04:23 PM - 05:23 PM	77.6	82.0	76.9	

Reference Method : ISO 1996-1 : 2016
Standard : ใช้มาตรฐานของกรมโรงงานอุตสาหกรรม และ มาตรฐานของกรมการขนส่งทางบก
Standard : มาตรฐานการวัดผลกระทบจากเสียงรบกวนในอาคารตาม พ.ร.บ.ร.บ.ร.

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Chontichak

Chonticha Subongkhot
Scientist (3)

Approved by

Supt S.

Supot Salameh
Section Head

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S: Reports_Air Noise (p) / 3.20PM



Analysis / Test Report

Client : Michelin Siam Co., Ltd.

129 Moo 3, Nong-Lu-Lok-Bankhai Road, Nong-Lu-Lok, Bankhai, Rayong Thailand 21120

P/O :

Project Name : Environment : EIA

Project Location :

Lot ID: 25101103

Date Received : Nov 07, 2025

Date Reported : Nov 13, 2025

Report Number: 3449844-1

Page 1 of 1

Sample Number	25101103-2			
Parameter	Noise (Leq 8 hrs.)			
Location	บริเวณเครื่องจักรและถนน (N4)			
Measurement Date	Nov 06, 2025			
Measurement by	Annat Wongsakthien			
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))	
09:22 AM - 10:22 AM	85.0	93.1	75.9	
10:22 AM - 11:22 AM	84.1	93.1	77.4	
11:22 AM - 12:22 PM	84.8	91.2	77.6	
12:22 PM - 01:22 PM	86.3	91.8	81.0	
01:22 PM - 02:22 PM	85.6	93.0	78.0	
02:22 PM - 03:22 PM	85.6	91.1	77.2	
03:22 PM - 04:22 PM	81.8	94.1	75.8	
04:22 PM - 05:22 PM	81.6	93.9	75.6	

Reference Method : ISO 1996-1 : 2016
Standard : ใช้มาตรฐานของกรมโรงงานอุตสาหกรรม และ มาตรฐานของกรมการขนส่งทางบก
Standard : มาตรฐานการวัดผลกระทบจากเสียงรบกวนในอาคารตาม พ.ร.บ.ร.บ.ร.

Technical Management

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Chonticha Subongkhot
Scientist (3)

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S: Reports_Air Noise (p) / 3.21PM

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ใบรับรองการสอบเทียบเครื่องมือ



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รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Stack	Oxides of Nitrogen	Console Control Unit	RVG F50315	10-Jul-25	10-Jan-26	6
Stack	Oxides of Nitrogen	Pilot Tube	RVG F50321	10-Jul-25	10-Jan-26	6
Stack	Oxides of Nitrogen	Fuel Gas Analyzer	RVG F50464	24-Jun-25	23-Jan-26	12
Stack	Oxides of Nitrogen	Vacuum Gauge	BKX F50479	20-Feb-26	20-Feb-26	18
Stack	Oxides of Nitrogen	SPECTROPHOTOMETER	RVG EN0179	18-Mar-25	18-Sep-26	18
Stack	Phosphoric acid	Console Control Unit	BKX F50527	10-Jul-25	10-Jan-26	6
Stack	Phosphoric acid	Pilot Tube	BKX F50531	10-Jul-25	10-Jan-26	6
Stack	Phosphoric acid	Fuel Gas Analyzer	RVG F50563	22-Jan-25	22-Jan-26	12
Stack	Phosphoric acid	Dry Gas	BKX F50534	10-Jul-25	10-Jan-26	6
Stack	Phosphoric acid	Ion Chromatography	BKX EN0069	24-Jun-25	24-Jun-26	12
Stack	Sulfuric Acid	Console Control Unit	BKX F50527	10-Jul-25	10-Jan-26	6
Stack	Sulfuric Acid	Pilot Tube	BKX F50531	10-Jul-25	10-Jan-26	6
Stack	Sulfuric Acid	Fuel Gas Analyzer	RVG F50563	22-Jan-25	22-Jan-26	12
Stack	Total Suspended Particulate	Console Control Unit	BKX F50527	10-Jul-25	10-Jan-26	6
Stack	Total Suspended Particulate	Pilot Tube	BKX F50532	10-Jul-25	10-Jan-26	6
Stack	Total Suspended Particulate	Fuel Gas Analyzer	RVG F50563	22-Jan-25	22-Jan-26	12
Stack	Total Suspended Particulate	Console Control Unit	RVG F50315	10-Jul-25	10-Jan-26	6
Stack	Total Suspended Particulate	Pilot Tube	RVG F50321	10-Jul-25	10-Jan-26	6
Stack	Total Suspended Particulate	Fuel Gas Analyzer	RVG F50464	24-Jun-25	23-Jan-26	12
Stack	Total Suspended Particulate	Digital Balance	RVG EN0069	20-Feb-25	20-Feb-26	12
Ambient	Total Suspended Particulate	High Volume	RVG F50395	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RVG F50181	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RVG F50175	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RVG F50173	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RVG F50178	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RVG F50664	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RVG F50663	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RVG F50174	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	RVG EN0069	20-Feb-25	20-Feb-26	12
Ambient	Nitrogen Dioxide	NO Analyzer	RVG F50335	3-Jul-25	3-Jan-26	6
Ambient	Nitrogen Dioxide	NO Analyzer	RVG F50459	3-Jul-25	3-Jan-26	6
Ambient	Nitrogen Dioxide	NO Analyzer	RVG F50452	1-Jul-25	1-Jan-26	6
Ambient	Nitrogen Dioxide	NO Analyzer	RVG F50461	3-Jul-25	3-Jan-26	6
Ambient	Nitrogen Dioxide	NO Analyzer	RVG F50732	3-Jul-25	3-Jan-26	6
Ambient	Nitrogen Dioxide	NO Analyzer	RVG F50731	3-Jul-25	3-Jan-26	6
Ambient	Nitrogen Dioxide	NO Analyzer	RVG F50335	3-Jul-25	3-Jan-26	6
Ambient	Nitrogen Dioxide	NO Analyzer	RVG F50333	3-Jul-25	3-Jan-26	6
Ambient	Sulfuric Acid	DRICAL FLOWMETER	RVG F50208	27-Jan-25	26-Jan-26	12
Ambient	Sulfuric Acid	DRICAL FLOWMETER	BKX F50614	9-Sep-24	9-Sep-25	12
Ambient	Sulfuric Acid	Ion Chromatography	BKX EN0069	10-Sep-25	9-Sep-26	12
Ambient	Phosphoric acid	DRICAL FLOWMETER	RVG F50208	27-Jan-25	26-Jan-26	12
Ambient	Phosphoric acid	DRICAL FLOWMETER	BKX F50614	9-Sep-24	9-Sep-25	12
Ambient	Phosphoric acid	Ion Chromatography	BKX EN0069	10-Sep-25	9-Sep-26	12
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RVG F50272	18-Sep-24	18-Mar-26	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	BKX F50141	20-Aug-24	20-Feb-26	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	BKX F50143	20-Aug-24	20-Feb-26	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RVG F50085	15-Jan-25	15-Jun-26	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RVG F50087	7-Oct-24	7-Apr-26	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RVG F50085	15-Jan-25	15-Jun-26	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RVG F50608	18-Jul-24	18-Jan-26	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RVG F50727	18-Sep-24	18-Mar-26	18
Noise	Leq 24 hrs	Sound Calibrator	RVG F50496	19-Mar-25	19-Jan-26	12
Noise	Leq 24 hrs	Sound Level Meter	RVG F50017	27-Jan-25	27-Jan-26	12



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รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Workplace	Total Dust	DRICAL FLOWMETER	RVG F50209	27-Jan-25	26-Jan-26	12
Workplace	Total Dust	DRICAL FLOWMETER	BKX F50614	9-Sep-24	9-Sep-25	12
Workplace	Total Dust	DRICAL FLOWMETER	BKX F50614	10-Sep-25	9-Sep-26	12
Workplace	Total Dust	Digital Balance	RVG EN0004	20-Feb-25	20-Feb-26	12
Workplace	Respirable Dust	DRICAL FLOWMETER	RVG F50208	27-Jan-25	26-Jan-26	12
Workplace	Respirable Dust	DRICAL FLOWMETER	BKX F50614	9-Sep-24	9-Sep-25	12
Workplace	Respirable Dust	DRICAL FLOWMETER	BKX F50614	10-Sep-25	9-Sep-26	12
Workplace	Respirable Dust	Digital Balance	RVG EN0004	20-Feb-25	20-Feb-26	12
Workplace	Phosphoric Acid	DRICAL FLOWMETER	RVG F50208	27-Jan-25	26-Jan-26	12
Workplace	Phosphoric Acid	DRICAL FLOWMETER	BKX F50614	9-Sep-24	9-Sep-25	12
Workplace	Phosphoric Acid	DRICAL FLOWMETER	BKX F50614	10-Sep-25	9-Sep-26	12
Workplace	Phosphoric Acid	Ion Chromatography	BKX EN0069	24-Jun-25	24-Jun-26	12
Workplace	Sulfuric Acid	DRICAL FLOWMETER	RVG F50208	27-Jan-25	26-Jan-26	12
Workplace	Sulfuric Acid	DRICAL FLOWMETER	BKX F50614	9-Sep-24	9-Sep-25	12
Workplace	Sulfuric Acid	Ion Chromatography	BKX EN0069	24-Jun-25	24-Jun-26	12
Noise	Leq 8 hrs	Sound Calibrator	RVG F50213	16-Jan-25	16-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RVG F50016	16-Sep-25	15-Sep-26	12
Noise	Leq 8 hrs	Sound Level Meter	RVG F50017	27-Jan-25	27-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RVG F50213	16-Jan-25	16-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RVG F50016	16-Sep-25	15-Sep-26	12
Noise	Leq 8 hrs	Sound Level Meter	RVG F50621	27-Jan-25	26-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RVG F50220	20-Dec-24	20-Dec-25	12
Heat	Heat Stress	Heat Stress Monitor	RVG F50219	27-Jan-25	26-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RVG F50221	20-Dec-24	20-Dec-25	12
Heat	Heat Stress	Heat Stress Monitor	RVG F50223	7-Jan-25	7-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RVG F50217	20-Dec-24	20-Dec-25	12
Heat	Heat Stress	Heat Stress Monitor	RVG F50219	9-Apr-25	8-Apr-26	12
Heat	Heat Stress	Heat Stress Monitor	RVG F50356	7-Jan-25	7-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RVG F50228	20-Dec-24	20-Dec-25	12
Heat	Heat Stress	Heat Stress Monitor	RVG F50218	9-Apr-25	8-Apr-26	12
Heat	Heat Stress	Heat Stress Monitor	RVG F50218	27-Jan-25	26-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RVG F50223	7-Jan-25	7-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RVG F50221	20-Dec-24	20-Dec-25	12
Heat	Heat Stress	Heat Stress Monitor	RVG F50357	7-Jan-25	7-Jan-26	12
Soil	Copper	ICP-OES	BKX EL0037	22-Sep-24	23-Mar-26	18
Soil	Copper	Hot Block	BKX EL0034	4-Mar-25	4-Sep-26	18
Soil	Copper	Chamber (Cooling Room)	BKX EN0167	4-Jun-25	4-Dec-26	18
Soil	Iron	ICP-OES	BKX EL0037	22-Sep-24	23-Mar-26	18
Soil	Iron	Hot Block	BKX EL0034	4-Mar-25	4-Sep-26	18
Soil	Iron	Chamber (Cooling Room)	BKX EN0167	4-Jun-25	4-Dec-26	18
Soil	Zinc	ICP-OES	BKX EL0037	22-Sep-24	23-Mar-26	18
Soil	Zinc	Hot Block	BKX EL0034	4-Mar-25	4-Sep-26	18
Soil	Zinc	Chamber (Cooling Room)	BKX EN0167	4-Jun-25	4-Dec-26	18
Rayong Lab	Temperature	pH meter	RVG F50296	25-Jun-25	25-Jun-26	12
Rayong Lab	pH at 25 °C	pH meter	RVG EN0183	18-Jul-25	18-Jul-26	18
Rayong Lab	DO meter with Sensor	DO meter	RVG EN0032	20-Jul-25	20-Jul-26	18
Rayong Lab	BOD	Incubator	RVG EN0154	1-Nov-24	1-May-26	18
Rayong Lab	BOD	Burette	RVG EN0216	18-Sep-25	18-Sep-26	12
Rayong Lab	COD	Spectrophotometer	RVG EN0037	18-Mar-25	18-Sep-26	18
Rayong Lab	Total Suspended Solids	Electronic Balance	RVG EN0163	20-Feb-25	20-Feb-26	12
Rayong Lab	Total Suspended Solids	Chamber (Oven)	RVG EN0012	10-Sep-25	10-Mar-27	18
Rayong Lab	Total Dissolved Solids 180°C	Electronic Balance	RVG EN0163	20-Feb-25	20-Feb-26	12
Rayong Lab	Total Dissolved Solids 180°C	Chamber (Oven)	RVG EN0012	10-Sep-25	10-Mar-27	18
Rayong Lab	Oil & Grease	Electronic Balance	RVG EN0003	20-Feb-25	20-Feb-26	12
Rayong Lab	Oil & Grease	Liquid Bath (Water)	RVG EN0220	27-Nov-25	27-Nov-26	12



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รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Water Lab	Iron	ICP-MS	BKX_EL0043	4-Oct-24	3-Apr-26	18
Water Lab	Iron	Hot Block Chamber (Cooling Room)	BKX_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Iron	ICP-MS	BKX_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Copper	ICP-MS	BKX_EL0043	4-Oct-24	3-Apr-26	18
Water Lab	Copper	Hot Block Chamber (Cooling Room)	BKX_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Copper	ICP-MS	BKX_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Zinc	ICP-MS	BKX_EL0043	4-Oct-24	3-Apr-26	18
Water Lab	Zinc	Hot Block Chamber (Cooling Room)	BKX_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Zinc	ICP-MS	BKX_EN0167	4-Jun-25	4-Dec-26	18
Rayong Lab	Conductivity	Conductivity meter	RTG_EN0200	21-Mar-25	21-Mar-26	12



CONSOLE CONTROL UNIT CALIBRATION TEST REPORT

Calibration of Date : 10-Jul-25
 Next Cal. Date : 10-Jan-26

Balometric Pressure (mmHg) : 751.3
 Relative Humidity (%) : 43.7
 Temperature (°C) : 27.0

Console Control Unit Data
 Calibration No. : C-100725-RYG_FS0315
 Dry Gas Meter ID : RYG_FS0315
 Serial No. : 1706091
 Model No. : XC-572-V

Reference Dry Gas Meter Data
 Reference Dry Gas Meter ID : BKK_FS0629
 Serial No. : 1607009
 Correction Factor (Y) : 1.0000
 Next Calibration Date : 10-Jan-26

ΔH (mm H ₂ O)	θ Minutes	Reference Dry Gas Meter Calibration						Console Control Drygas Meter						Dry Gas Meter Correction Factor (Y)	Office Calibration Factor ΔH/g
		V (Liters)			T _g (°C)			V _m (Liters)			T _l (°C)				
		Final	Initial	Total	Final	Initial	Total	Final	Initial	Total	Final	Initial	Total		
15	12.07	150.00	0.00	150.00	25.0	127.516.0	127.516.0	150.00	25.0	25.0	25.0	25.0	25.0	0.9985	41.506
25	9.37	150.00	0.00	150.00	26.0	127.614.0	127.614.0	151.00	26.0	26.0	26.0	26.0	26.0	0.9910	44.809
50	8.34	150.00	0.00	150.00	26.0	127.840.0	127.840.0	150.00	26.0	26.0	26.0	26.0	26.0	0.9951	40.7166
80	5.11	150.00	0.00	150.00	26.0	128.007.0	128.007.0	150.00	26.0	26.0	26.0	26.0	26.0	0.9192	42.5077
120	4.12	150.00	0.00	150.00	26.0	128.168.0	128.168.0	151.00	26.0	26.0	26.0	26.0	26.0	0.9891	42.1802
														Avg.	

Y : Ratio of reading of reference to dry gas meter : 1.002 from average

ΔH/g : Dry gas pressure differential that results in 21.24 in of air @ 25 °C and 750 mm of mercury. mmH₂O : tolerance for individual values ± 0.02 from average

Calculated by : *Saksit Phaisanphit*

(Mr. Jittakorn Sriwara)
 RYG Field Service Specialist (2)

Approved by : *Nattapon Jengwareewong*
 (Mr. Nattapon Jengwareewong)
 RYG Field Service Specialist (1)

Form No. : F-08-027 REVISION NO. : 0011 Date of Issue : 10-Jul-25



DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date :	10 Jul 25	Ambient Temperature (°C) :	27		
Calibration sheet No. :	C-100725-RYG_FS0315	Relative Humidity (%) :	43.7		
Digital Temperature ID :	RYG_FS9315	Reference Temperature ID :	BKK_FS1144		
Serial No. :	1706091	Serial No. :	201090000013		
Model :	XC-572-V	Model :	Digicon-CC-VT-MS		
		Next Calibrate :	5 Jan 26		
Location	Reference Temperature °C	Digital Temperature °C	Error °C	MPE	Pass / Fail
Stick	0	-1	-1	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
	100	100	0	±3	Pass
	150	149	-1	±3	Pass
	200	198	-2	±3	Pass
	250	248	-2	±3	Pass
	300	298	-2	±3	Pass
	500	498	-2	±3	Pass
	1000	998	-2	±3	Pass
Probe	120	116	-2	±3	Pass
	140	138	-2	±3	Pass
	160	158	-2	±3	Pass
Oven	100	98	-2	±3	Pass
	120	118	-2	±3	Pass
	140	139	-1	±3	Pass
Fiber	100	99	-1	±3	Pass
	120	118	-2	±3	Pass
	140	138	-2	±3	Pass
Exit	0	0	0	±3	Pass
	10	8	-2	±3	Pass
	20	19	-1	±3	Pass
Meter	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
AUX	0	-1	-1	±3	Pass
	25	23	-2	±3	Pass
	50	48	-2	±3	Pass

MPE : (Maximum permissible error of measurement) ค่าความคลาดเคลื่อนที่อนุญาต

Calibrated by : *Saksit Phaisanphit*
 (Mr. Jittakorn Sriwara)
 RYG Field Service Specialist (3)

Approved by : *Nattapon Jengwareewong*
 (Mr. Nattapon Jengwareewong)
 RYG Field Service Specialist (1)

FORM NO. : F-08-027 REVISION NO. : 2 ISSUE DATE: 18/3/23



PROBE NOZZLE DIAMETER CALIBRATION DATA SHEET

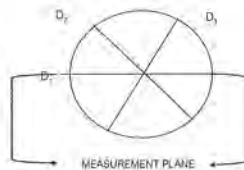
Calibration Date :	10 Jul 25	Nozzle Set ID. :	RYG_FS0319		
Calibration Sheet No. :	C-060225-RYG_FS0319	Vernier Caliper ID.:	RYG_FS0539		
Nozzle ID #	Nozzle Diameter (cm.)			Hi - Lo	$(D_1 + D_2 + D_3) / 3$
	D ₁	D ₂	D ₃	ΔD	D _{avg}
1	0.301	0.300	0.300	0.001	0.300
2	0.465	0.468	0.465	0.003	0.466
3	0.540	0.539	0.540	0.001	0.540
4	0.602	0.605	0.605	0.003	0.604
5	0.765	0.760	0.765	0.005	0.763
6	0.929	0.928	0.930	0.002	0.929
7	1.082	1.080	1.080	0.002	1.081
8	1.235	1.230	1.235	0.006	1.233
9	1.594	1.588	1.599	0.011	1.594

Where :

D₁, D₂, D₃ : Three different nozzle diameters at 60 degrees to each other, each measured the nearest 0.025 mm.

ΔD : Maximum distance between any two diameters, must be ≤ 0.100 mm.

D_{avg} : (D₁ + D₂ + D₃) / 3



Calibrated by : *Saksit Phaisanphit*
 (Mr. Saksit Phaisanphit)
 RYG Field Service Scientist (4)

Approved by : *Nattapon Jengwareewong*
 (Mr. Nattapon Jengwareewong)
 RYG Field Service Specialist (1)

FORM NO. : F-06-114 REVISION NO. : 0011 Date of Issue : 10-Jul-25



Type S Pitot Tube Calibration

Date Calibration : 10-Jul-25
 Pitot ID : RYG_FS0321
 Pitot SN : -

Due Date : 10-Jan-26
 Inclinator ID : BKK_FS1131
 Vernier ID : RYG_FS0539



Parameter	Value	Allowable Range	Check
α1	-1.4	-10° < α1 < +10°	OK
α2	-0.2	-10° < α2 < +10°	OK
β1	0.8	-5° < β1 < +5°	OK
β2	-0.4	-5° < β2 < +5°	OK
γ	0.8	-	-
θ	0.5	-	-
Z = A tan γ	0.013	Z ≤ 0.125"	OK
W = A tan θ	0.008	W ≤ 0.031"	OK
Dt	0.310	0.188" to 0.375"	OK
A/2Dt	1.484	1.05 ≤ PA/Dt ≤ 1.5	OK
A	0.92	2.1Dt ≤ A ≤ 3Dt	OK

Certify that pitot tube/probe meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube certification factor of 0.84. See 40 CFR Pt. 60, App. A, EPA Method 2.

Calibrated by : *Saksit Phaisanphit*
 (Mr. Saksit Phaisanphit)
 RYG Field Services Scientist (4)

Approved by : *Nattapon Jengwareewong*
 (Mr. Nattapon Jengwareewong)
 RYG Field Services Specialist (1)

FORM NO. : F-06-114 REVISION NO. : 0 ISSUE DATE: 25/12/21



Certificate No.: G 680210
Date of issue : 25-Mar-25

Instrument description : Gas Analyser
Instrument model : Testo 350 New
Instrument serial no. : 62007344/1119
Control unit serial no. : 03401649/1119
ID no. or control no. : RYG_F50464
Manufacturer : Testo SE & Co. KGaA
Probe description : -
Probe model : -
Probe serial no. : -
Customer name : ALS LABORATORY GROUP (THAILAND) CO.,LTD.
Customer address : 104 Phatthanakan 40, Phatthanakan Road, Khwaeng Phatthanakan, Khet Suan Luang, Bangkok, 10250 Thailand
Total pages of certificate : 3 Pages
Receiving no. : L-250746
Receiving date : 18-Mar-25
Parameter of calibration : Gas Calibration (Oxygen 2.50, 9.984, 21.02 %Vol, Carbon Monoxide 80.45, 202.107 ppm, Nitrogen Dioxide 30.68, 81.8, 202.6 ppm, Nitric Oxide 30.0, 151.8, 322.5 ppm, Sulphur Dioxide 50.36, 100.7, 500.8 ppm)
Condition of UUC : Used
Ambient condition : All of the Measurement were carried out the stabilized laboratory
Temperature : 23.45 °C
Humidity : 55 ± 15 %RH
Calibration place : 17/121 Soi Nijamwongwan 47 Yeak 48, Toongsongkhong, Latse, Bangkok 10210 THAILAND
Calibration procedure no : This instrument was calibrated by comparison with Standard gas mixture according to calibration Work Instruction no. WI-CL-28-C
The calibration certificate expanded uncertainty of measurement is stated as the standard uncertainty of measurement. Multiplied by coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. This certificate is applied only to item under test Environmental conditions.
This Calibration Certificate may not be re-calibrated other than in full except with the permission of the issuing laboratory. Calibration certificates without signature and seal are not valid and the results relate only to the items tested/calibrated.
This calibration certificate documents are traceability to national standards, which realize measurement according to the International System of Units (SI).
Date of calibration : 24-Mar-25

Mr. Kwanjai Khamsoung
Calibration Technician

Mrs. Nongluck Wangpattee
Technical Manager

HA-CL-09-C Rev.8

Page 1 of 3

Issued Date 25/03/25

Entech Industrial Solution Co.,Ltd.

17/121 Soi Nijamwongwan 47 Yeak 48 Toongsongkhong, Latse, Bangkok 10210 THAILAND Tel: 0-2779-8988 Calibration@entech.co.th
Fax: 0-2105536035591 www.entech.co.th



Certificate No.: G 680210

Standard References (Table 1)

Standard	Certificate No.	Vendor	Due date
Oxygen (O2) 2.50 % Vol	2412/23	Line	27-Aug-27
Oxygen (O2) 9.984 % Vol	CG-0113-24	Nint	01-Aug-29
Oxygen (O2) 21.02 % Vol	CG-0041-22	Nint	10-Feb-27
Carbon monoxide (CO) 80.45 ppm	CG-0132-24	Nint	10-Sep-29
Carbon monoxide (CO) 202 ppm	1915/23	Line	16-Jun-25
Carbon monoxide (CO) 1007 ppm	1870/24	Line	17-Jun-26
Nitrogen Dioxide (NO2) 30.68 ppm	2832/24	Line	08-Sep-26
Nitrogen Dioxide (NO2) 81.8 ppm	2330/24	Line	01-Aug-26
Nitrogen Dioxide (NO2) 202.6 ppm	3794/24	Line	23-Dec-26
Nitric Oxide (NO) 30.0 ppm	CG-0065-24	Nint	06-May-26
Nitric Oxide (NO) 151.8 ppm	0404/25	Line	09-Feb-27
Nitric Oxide (NO) 322.5 ppm	1974/23	Line	17-Jul-25
Sulphur Dioxide (SO2) 50.36 ppm	2004/23	Line	17-Jul-25
Sulphur Dioxide (SO2) 100.7 ppm	2662/24	Line	25-Aug-26
Sulphur Dioxide (SO2) 500.8 ppm	2003/23	Line	17-Jul-25

Measured room conditions

Temperature : 22.7 °C Humidity : 62.6 %RH Pressure : 1010.5 mbar

Calibration conditions

Gas Temperature : 23 °C Flow rate : 1,300 ml/min Gas pressure : 1016.2 mbar

Calibration Results (Before adjustment) (Table 2)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (±)
O2 (%Vol)	2.50	2.46	-0.04	0.15
O2 (%Vol)	9.984	9.95	-0.034	0.20
O2 (%Vol)	21.02	21.08	0.06	0.30
CO (ppm)	80.45	81	0.55	3.0
CO (ppm)	302	302	0	6.0
CO (ppm)	1007	1010	3	12
NO2 (ppm)	30.68	29.9	-0.78	8.0
NO2 (ppm)	81.8	67.1	-14.7	8.0
NO2 (ppm)	202.6	181.3	-21.3	12
NO (ppm)	30.0	24	-6.0	8.0
NO (ppm)	151.8	145	-6.8	8.0
NO (ppm)	322.5	302	-20.5	12
SO2 (ppm)	50.36	48	-2.36	6.0
SO2 (ppm)	100.7	97	-3.7	6.0
SO2 (ppm)	500.8	599	-11.8	12

HA-CL-09-C Rev.8

Page 2 of 3

Issued Date 25/03/25

Entech Industrial Solution Co.,Ltd.

17/121 Soi Nijamwongwan 47 Yeak 48 Toongsongkhong, Latse, Bangkok 10210 THAILAND Tel: 0-2779-8988 Calibration@entech.co.th
Fax: 0-2105536035591 www.entech.co.th



Certificate No.: G 680210

Calibration Results (After adjustment) (Table 3)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (±)
O2 (%Vol)	2.50	2.46	-0.04	0.15
O2 (%Vol)	9.984	9.95	-0.034	0.20
O2 (%Vol)	21.02	21.08	0.06	0.30
CO (ppm)	80.45	81	0.55	3.0
CO (ppm)	302	302	0	6.0
CO (ppm)	1007	1010	3	12
NO2 (ppm)	30.68	29.9	-0.78	8.0
NO2 (ppm)	81.8	79.7	-2.1	8.0
NO2 (ppm)	202.6	199.2	-3.4	12
NO (ppm)	30.0	30	0.0	8.0
NO (ppm)	151.8	153	1.2	8.0
NO (ppm)	322.5	324	1.5	12
SO2 (ppm)	50.36	50	-0.36	6.0
SO2 (ppm)	100.7	101	0.3	6.0
SO2 (ppm)	500.8	599	-1.8	12

Remark : 1 cmol/mol = 1 %vol, 1 µmol/mol = 1 ppm, Sensor CO New.

End of Report



210/1118 89 Toongsongkhong, Latse, Bangkok 10210 THAILAND Tel: 0-2779-8988 Calibration@entech.co.th
Fax: 0-2105536035591 www.entech.co.th



CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : VACUUM GAUGE
MANUFACTURER : DWYER
MODEL / TYPE : DPGA-00
SERIAL NO. : DVG06(BKK_F50479)
CLID NO. : 212300278
JOB CONTROL NO. : 240819087098
CALIBRATION SERVICE : ☒ IN-LABORATORY ☐ ON-SITE

REVIEW BY : *Phon P.*
APPROVED BY : *[Signature]*
NEXT CAL DATE : 10 Sep 25/25

CUSTOMER : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN RD.,
KHAENG PHATTHANAKAN, KHET SUAN LUANG, BANGKOK 10250, THAILAND

DATE OF RECEIVED : 19 August 2024

DATE OF ISSUED : 22 August 2024

This Certificate of Calibration shall not be reproduced except in full without approval of the Calibration Laboratory Co., Ltd.

Calibrated By : Sitipong Pimdec
Calibration Engineer

Approved By : Mongkol Yotsoontorn
Authorized Signatory
22 August 2024



This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI).

Certificate No. QJ4087098

13-01-09/12-23

Page 1 of 1

HA-CL-09-C Rev.8

Page 3 of 3

Issued Date 26/03/25

Entech Industrial Solution Co.,Ltd.

17/121 Soi Nijamwongwan 47 Yeak 48 Toongsongkhong, Latse, Bangkok 10210 THAILAND Tel: 0-2779-8988 Calibration@entech.co.th
Fax: 0-2105536035591 www.entech.co.th





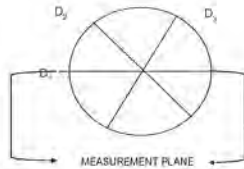
PROBE NOZZLE DIAMETER CALIBRATION DATA SHEET

Calibration Date : 10 Jul 25	Nozzle Set ID : BKK_F50533
Calibration Sheet No. : C-100725-BKK_F50533	Vernier Caliper ID : RYG_F50539

Nozzle ID #	Nozzle Diameter (cm.)			H ₁ - L ₂ ΔD	(D ₁ + D ₂ + D ₃) / 3 D _{avg}
	D ₁	D ₂	D ₃		
1	0.316	0.312	0.310	0.006	0.313
2	0.480	0.475	0.474	0.006	0.476
3	0.536	0.535	0.540	0.005	0.537
4	0.631	0.622	0.635	0.013	0.629
5	0.787	0.792	0.789	0.005	0.789
6	0.948	0.949	0.951	0.003	0.949
7	1.084	1.080	1.089	0.009	1.084
8	1.268	1.266	1.264	0.004	1.266
9	1.600	1.592	1.598	0.008	1.597

Where :

- D₁, D₂, D₃ : Three different nozzle diameters at 60 degrees to each other, each measured the nearest 0.025 mm.
- ΔD : Maximum distance between any two diameters, must be ≤ 0.100 mm.
- D_{avg} : (D₁ + D₂ + D₃) / 3



Calibrated by :
(Mr. Warawut Putpa)
RYG Field Services Scientist (3)

Approved by :
(Mr. Nattapong Jengwarewong)
RYG Field Services Specialist (1)

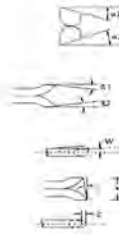
Issue No. : F 05-124 Rev. 01/25 Issue Date : 25/12/23



Type S Pitot Tube Calibration

Date Calibration : 10-Jul-25
Pitot ID : BKK_F50531
Pitot SN : -

Due Date : 10-Jan-26
Inclinometer ID : BKK_F51131
Vernier ID : RYG_F50539



Parameter	Value	Allowable Range	Check
α1	6.2	-10° < α1 < +10°	OK
α2	4.2	-10° < α2 < +10°	OK
β1	4.7	-5° < β1 < +5°	OK
β2	0.9	-5° < β2 < +5°	OK
γ	1.7	-	-
θ	1.6	-	-
Z = A tan γ	0.026	Z ≤ 0.125"	OK
W = A tan θ	0.024	W ≤ 0.031"	OK
Dt	0.375	0.188" to 0.375"	OK
A/2Dt	1.160	1.05 ≤ PA/Dt ≤ 1.5	OK
A	0.87	2.1Dt ≤ A ≤ 3Dt	OK

Certify that pitot tube/probe meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube certification fact of 0.84 . See 40 CFR Pt. 60, App. A, EPA Method 2.

Calibrated by :
(Mr. Warawut Putpa)
RYG Field Services Scientist (3)

Approved By :
(Mr. Nattapong Jengwarewong)
RYG Field Services Specialist (1)

Issue No. : F 05-124 Rev. 01/25 Issue Date : 25/12/23



Calibration Certificate



Certificate No.: G 680948
Date of issue : 27-Jan-25

REVIEW BY :

APPROVED BY :

NEXT CAL DATE : 22/01/2026

Instrument description : Flue Gas Analyzer
Instrument model : Testo 350 New
Instrument serial no. : 6295047/1121
Control unit serial no. : 03580098/1125
ID no. or control no. : RYG_F50563
Manufacturer : Testo SE & Co. KGaA
Probe description : -
Probe model : -
Probe serial no. : -
Customer name : ALS LABORATORY GROUP (THAILAND) CO., LTD.
Customer address : 101 Phatthanasak 40, Phatthanasak Road, Kwang Phatthanasak, Khet Suan Luang, Bangkok, 10250 Thailand

Total pages of certificate : 2 Pages
Receiving no. : C-250179
Receiving date : 22-Jan-25
Parameter of calibration : Gas Calibration (Oxygen 2.50, 9.984, 21.02 % Vol, Carbon Monoxide 80.45, 302, 1007 ppm)
Nitrogen Dioxide 30.68, 81.8, 201.9 ppm, Nitric Oxide 30.0, 151.5, 322.5 ppm, Sulphur Dioxide 50.36, 100.7, 600.8 ppm)

Condition of UUC : Used
Ambient condition : All of the Measurement was carried out in the stabilized laboratory
Temperature : 23.45 °C
Humidity : 55 ± 15 %RH

Calibration place : 17/121 Soi Ngamwongwan 47 Yeak 48, Toongsoenghong, Lakso, Bangkok 10210

Calibration procedure no : This instrument was calibrated by comparison with standard gas mixture according to calibration Work Instruction no. W-CL-28-C.

The calibration certificate expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. This certificate is applied only to item under test Environmental condition.

This Calibration Certificate may not be reproduced other than in full except with the permission of the issuing laboratory. Calibration certificates without signature and seal are not valid and the results relate only to the items tested/calibrated.

This calibration certificate documents are traceability to national standards, which realize measurement according to the International System of Units (SI).

Date of calibration : 22-Jan-25

Mr. Kwanchai Khamsuang
Calibration Technician

Mrs. Jiragluck Wongsettee
Technical Manager



Calibration Certificate



Certificate No.: G 680948

Standard References (Table 1)

Standard	Certificate No.	Vendor	Due date
Oxygen (O2) 2.50 % Vol	2412/23	Unde	27-Aug-27
Oxygen (O2) 9.984 % Vol	CG-0112-24	Nimt	01-Aug-29
Oxygen (O2) 21.02 % Vol	CG-0041-22	Nimt	10-Feb-27
Carbon monoxide (CO) 80.45 ppm	CG-0132-24	Nimt	10-Sep-29
Carbon monoxide (CO) 302 ppm	1915/23	Unde	16-Jan-25
Carbon monoxide (CO) 1007 ppm	1870/23	Unde	17-Jun-26
Nitrogen Dioxide (NO2) 30.68 ppm	1852/24	Unde	08-Sep-26
Nitrogen Dioxide (NO2) 81.8 ppm	2336/24	Unde	01-Aug-26
Nitrogen Dioxide (NO2) 201.9 ppm	1975/23	Unde	17-Jul-25
Nitric Oxide (NO) 30.0 ppm	CG-0065-24	Nimt	06-May-26
Nitric Oxide (NO) 151.5 ppm	0161/23	Unde	22-Jan-25
Nitric Oxide (NO) 322.5 ppm	5974/23	Unde	17-Jul-25
Sulphur Dioxide (SO2) 50.36 ppm	2004/23	Unde	17-Jul-25
Sulphur Dioxide (SO2) 100.7 ppm	2602/24	Unde	25-Aug-26
Sulphur Dioxide (SO2) 600.8 ppm	2603/23	Unde	17-Jul-25

Measured room conditions

Temperature : 22.6 °C Humidity : 64.8 %RH Pressure : 1012.7 mbar

Calibration conditions

Gas Temperature : 23 °C Flow rate : 1,300 mL/min Gas pressure : 1016.3 mbar

Calibration Results (Without adjustment) (Table 2)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (±)
O2 (%Vol)	2.50	2.47	0.03	0.15
O2 (%Vol)	9.984	9.92	-0.064	0.20
O2 (%Vol)	21.02	21.12	0.10	0.30
CO (ppm)	80.45	82	1.55	3.0
CO (ppm)	302	305	3	6.0
CO (ppm)	1007	1011	4	12
NO2 (ppm)	30.68	28.8	-1.88	8.0
NO2 (ppm)	81.8	79.9	-1.9	8.0
NO2 (ppm)	201.9	199.7	-2.2	12
NO (ppm)	30.0	31	1.0	6.0
NO (ppm)	151.5	153	1.5	8.0
NO (ppm)	322.5	324	1.5	12
SO2 (ppm)	50.36	51	0.64	6.0
SO2 (ppm)	100.7	102	1.3	6.0
SO2 (ppm)	600.8	605	4.2	13

Remark : 1 cmol/mol = 1 %Vol, 1 μmol/mol = 1 ppm.

End of Report



DRY GAS METER CALIBRATION TEST REPORT

Calibration of Date : 10-Jul-25
 Next Calibration Date : 10-Jan-26
 Barometric Pressure (mm Hg) : 750
 Relative Humidity (%) : 40.0
 Temperature (°C) : 26.5
 Dry Gas Meter Data
 Calibration sheet No.: C-190725-BKK_FS0534
 Dry Gas Meter ID : BKK_FS0534
 Serial No. : 1605011
 Model No : XC-62-2V
 Reference Dry Gas Meter Data
 Reference Dry Gas Meter ID : BKK_FS0529
 Serial No. : 1607009
 Correction Factor (Y) : 1.0000
 Next Calibration Date : 10-Jan-26

Reference Dry Gas Meter Calibration				Dry Gas Meter				Dry Gas Meter Correction	
Vr (liters)			Ti	Vm (liters)			Ti	Tr	Avg Tr
Final	Initial	Total	(°C)	Final	Initial	Total	(°C)	(°C)	(°C)
30.00	0.00	30.00	27.0	29.19	0.00	29.19	26.0	27.0	26.5
30.00	0.00	30.00	27.0	29.31	0.00	29.31	27.0	27.0	1.0295
60.01	0.00	60.01	27.0	58.19	0.00	58.19	27.0	27.0	1.0313
60.02	0.00	60.02	28.0	58.24	0.00	58.24	28.0	28.0	1.0306
90.00	0.00	90.00	29.0	87.42	0.00	87.42	29.0	29.0	1.0295
90.00	0.00	90.00	29.0	87.54	0.00	87.54	29.0	29.0	1.0261
									Aug
									1.0282

Y = Ratio of reading of reference dry gas meter to dry gas meter; tolerance for individual ± 0.05 from average

Calibrated by:

Mr. Warawut Pubpa

Mr. Warawut Pubpa
 RYG Field Service Scientist (3)

Approved by:

Mr. Natthapol Jengwarewong

Mr. Natthapol Jengwarewong
 RYG Field Service Specialist (1)

FORM NO: F-16-075 REVISION NO: 1 ISSUE DATE: 15/8/23



DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date : 10 Jul 25		Ambient Temperature (°C) 26.5			
Calibration sheet No. : C-190725-BKK_FS0534		Relative Humidity (%) : 40.0			
Digital Temperature ID : BKK_FS0534		Reference Temperature ID BKK_FS1144			
Serial No. : 2251922		Serial No. : 201000000013			
Model : FM-5C		Model : Digicon-CC-VI-MS			
		Next Calibrate : 5 Jan 26			
Location	Reference Temperature °C	Digital Temperature °C	Error °C	MPE	Pass / Fail
Stack	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	51	1	±3	Pass
	100	99	-1	±3	Pass
	150	148	-2	±3	Pass
	200	200	0	±3	Pass
	250	248	-2	±3	Pass
	300	298	-2	±3	Pass
	500	498	-2	±3	Pass
	Probe	100	99	-1	±3
120		120	0	±3	Pass
140		138	-2	±3	Pass
160		158	-2	±3	Pass
Oven	100	-	-	-	-
	120	-	-	-	-
	140	-	-	-	-
Filter	100	99	-1	±3	Pass
	120	118	-2	±3	Pass
	140	138	-2	±3	Pass
	160	158	-2	±3	Pass
Exit	0	0	0	±3	Pass
	10	10	0	±3	Pass
	20	20	0	±3	Pass
	30	30	0	±3	Pass
Meter	0	1	1	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
	75	75	0	±3	Pass
AUX	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
	75	75	0	±3	Pass

MPE : (Maximum permissible error of measurement) ค่าการวัดสูงสุดที่อนุญาตให้ผิดพลาดได้

Calibrated by:

Mr. Warawut Pubpa

Mr. Warawut Pubpa
 RYG Field Service Scientist (3)

Approved by:

Mr. Natthapol Jengwarewong

Mr. Natthapol Jengwarewong
 RYG Field Service Specialist (1)

FORM NO: F-06-027 REVISION NO: 2 ISSUE DATE: 18/2/23



Certificate of Calibration ICS-2100: Anion (ID#659)

This certificate is to verify that instrument below are calibrated
 by Archemica Lab Co., Ltd.

ICS-2100 S/N: 11080010
 AS-HV S/N: 5450A36659

For

ALS Laboratory Group (Thailand) Co., Ltd.



Operator Signature: *Mr. Soranat Thongnop*
 Application Chemist

Date: June 17-24, 2025



Type S Pitot Tube Calibration

Date Calibration : 10-Jul-25
 Pitot ID : BKK_FS0532
 Pitot SN : -

Due Date : 10-Jan-26
 Inclinator ID : BKK_FS1131
 Vernier ID : RYG_FS0539



Parameter	Value	Allowable Range	Check
α1	-3.2	-10° < α1 < +10°	OK
α2	1.2	-10° < α2 < +10°	OK
β1	0.2	-5° < β1 < +5°	OK
β2	0.3	-5° < β2 < +5°	OK
γ	0.6	-	-
θ	-1.3	-	-
Z = A tan γ	0.010	Z ≤ 0.125"	OK
W = A tan θ	-0.021	W ≤ 0.031"	OK
Dt	0.310	0.188" to 0.375"	OK
A/2Dt	1.484	1.05 ≤ A/2Dt ≤ 1.5	OK
A	0.92	2.1Dt ≤ A ≤ 3Dt	OK

Certify that pitot tube/porbe meets or exceeds all specifications,
 criteria and/or applicable design features and is hereby assigned a pitot tube
 certification fact of 0.84 . See 40 CFR Pt. 60, App. A, EPA Method 2.

Calibrated by:

Mr. Warawut Pubpa
 RYG Field Services Scientist (3)

Approved by:

Mr. Natthapol Jengwarewong
 RYG Field Services Specialist (1)

FORM NO: F-06-324 REVISION NO: 0 ISSUE DATE: 25/12/23



Accredited by

NSC-TISI-TIS 17025

Calibration 0426

Calibration certificate

Calibration Certificate No. 25BKL0003

Object	Electronic non-automatic weighing instrument	This calibration certificate documents the traceability to national standards.
Manufacturer	Sartorius	Uncertainties of measurements are taken into account when only statements of compliance are made.
Type	MSU224S-100-DU	This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP-WI 03.
Serial QM Ident. no.	31709552 RYG_EN0003	This certificate relate and apply this equipment only.
Customer	ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)	
	616/10 Moo 5 T. Maenam Ithu, A. Pluak Daeng, Rayong 21140, Thailand.	
Order no.	2230	
Number of pages	4	
Date of calibration	20 Feb 2025	



This calibration certificate may not be reproduced other than in full except with the permission of NSC-TISI-TIS-17025 and the issuing laboratory. Calibration certificates without signature are not valid.

The user is obliged to have the object recalibrated at appropriate intervals.

Date	06 Mar 2025	Approval of the Calibration Certificate	Person in charge
		Mr. Chonchai Inthana	Kachien Laloe

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang
10310 Bangkok

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Version 6.5

Page 1 | 4

Calibration certificate No.: 25BKL0003

Calibration Certificate

Adjustment Status

The measuring device was internally adjusted before the calibration.

Environmental and measuring conditions

Date of calibration	20 Feb 2025
Temperature at place of calibration Temp. diff. weights - T place	24.7 °C 0.3 K
Measuring conditions	The installation site is suitable. The device was levelled. Balance was loaded up to Max before test.
Comments	Humidity 62.3 %RH.

Measurement results | Measurement uncertainties

Repeatability		Eccentricity	
Test load (nominal): 10 g 200 g		Test load (nominal): 100 g	
	10 g		200 g
1	10.0000 g	200.0000 g	
2	10.0000 g	200.0001 g	
3	9.9999 g	200.0000 g	
4	10.0000 g	200.0000 g	
5	10.0000 g	200.0001 g	
6	9.9999 g	200.0000 g	
7	10.0000 g	200.0000 g	
8	10.0000 g	200.0000 g	
9	10.0000 g	200.0000 g	
10	10.0000 g	200.0001 g	
s = 0.0004 g		s = 0.0005 g	

Error of indication					
Testload	Indication	Error	Expansion factor	Uncertainty	Uncertainty relative
L	I	E	k	U(E)	U _{rel} (E)
0.0100 g	0.0100 g	0.0000 g	2.00	0.00012 g	1.2 %
0.1000 g	0.1000 g	0.0000 g	2.00	0.00013 g	0.13 %
0.5000 g	0.5000 g	0.0000 g	2.00	0.00013 g	0.026 %
1.0000 g	1.0000 g	0.0000 g	2.00	0.00013 g	0.013 %
5.0000 g	5.0000 g	0.0000 g	2.00	0.00013 g	0.0026 %
10.0000 g	10.0000 g	0.0000 g	2.00	0.00013 g	0.0013 %
20.0000 g	20.0000 g	0.0000 g	2.00	0.00014 g	0.00068 %
50.0000 g	50.0000 g	0.0000 g	2.00	0.00015 g	0.00029 %
100.0000 g	100.0001 g	0.0001 g	2.00	0.00018 g	0.00018 %
200.0000 g	200.0000 g	0.0000 g	2.00	0.00028 g	0.00014 %
220.0000 g	220.0000 g	0.0000 g	2.00	0.00032 g	0.00015 %

Maximum error of indication | E_{max} = 0.0001 g

U_{rel}(E) is the quotient of U(E) and test load L. The uncertainty of measurement U(E) is valid only if error E is considered. You will find reference notes on the uncertainty of measurement in use under Appendix to the calibration certificate | Interpretation of measurement results.

Reference note: The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the documented expansion factor, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

End of calibration certificate

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129 Rama 9 Road, Huaykwang
10310 Bangkok

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Page 3 | 4

Calibration certificate No.: 25BKL0003

Calibration Certificate

Calibration object

Single range instrument

Model	MSU224S-100-DU
Serial Number	31709552
QM Ident. no Inventory no.	RYG_EN0003 —

Maximum capacity (Max. load)	220.0000 g
Measured range	220.0000 g
Scale interval	0.0001 g

Place of calibration

Address	According to page 1
Department Cost center	Laboratory Department. —
Building Floor	— 1st Floor.
Room	Balance Room.
Maximum temperature variation at place of calibration	5 K

Calibration procedure

EURAMET cg-18, V4.0 - Guidelines on the Calibration of Non-Automatic Weighing Instruments

Test equipment

Test equipment type	Test equipment ID	Valid until
Thermometer	MHB-382SD s/nB011342 Traceable to SI unit through DKSH	21 Aug 2025
Test weight set OIML R111 E2	Certificate No.M23081975_E2(Traceable to SI unit through TCS)	23 Aug 2025

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10310 Bangkok

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Page 2 | 4

Interpretation of measurement results | Appendix to the calibration certificate

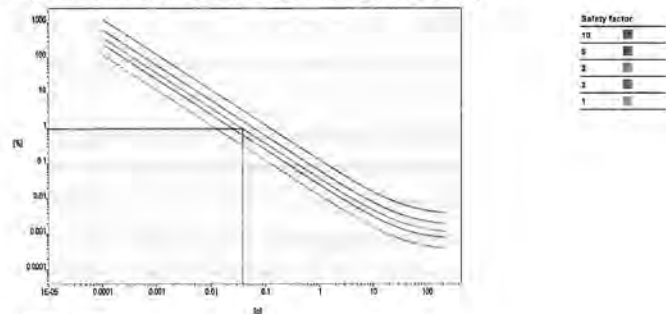
Uncertainty of measurement in use

Device adjusted before measurement	Yes
Temperature deviation considered	1.5 K (isoCAL active)
Temperature coefficient considered	1 · 10 ⁻⁴ %/K
Uncertainty of the weighing result U ₉₅ (W)	U ₉₅ (W) = 0.00013 g + 3.42 · 10 ⁻⁴ · R

Reference note: The current uncertainty of measurement is calculated by entering of the reading R into this formula. In addition to this, there is no need for a correction of the indication error. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied with an Expansion factor of 2, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

Indication in % from max load	Net indication R	Uncertainty U ₉₅ (W)	Uncertainty relative U ₉₅ (W)/W
1 %	2.2000 g	0.00014 g	0.0053 %
25 %	55.0000 g	0.00032 g	0.00058 %
50 %	110.0000 g	0.00051 g	0.00046 %
75 %	165.0000 g	0.00069 g	0.00042 %
100 %	220.0000 g	0.00088 g	0.00040 %

Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example

Process accuracy	1.00 %
Safety factor	3
Minimum sample weight	0.0380 g

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10310 Bangkok

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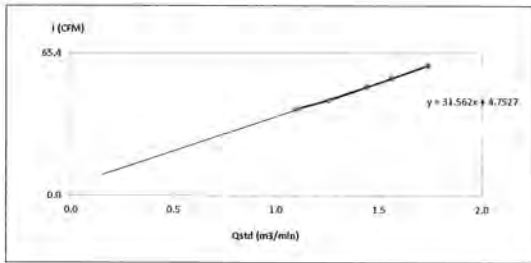
Page 4 | 4



High Volume Air Sampler Calibration Worksheet

Project Site: Michelin Siam Co., Ltd. Barometric Pressure (mm Hg): 756.3
Calibrate Location: สำนักควบคุมมลพิษภาคกลาง (A1) Temperature (°C): 28.6
Calibrate Date: 28-Sep-25 Calibration Sheet No.: C-280925-RYG_FS0395 High Volume ID: RYG_FS0395
Calibrator ID: RYG_FS0206 High Volume Model: TE-5170D
Calibrator Model: TE-5028A High Volume S/N: 5692
Calibrator S/N: 1543 Calibrator Slope: 1.48469
Calibrator Intercept: -0.02523

Test No.	Delta H ₂ O (Inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.6	1.1021	40	Slope: 31.5618 Intercept: 4.7527 Correlation Coefficient: 0.9989
2	3.4	1.2567	44	
3	4.5	1.4420	50	
4	5.3	1.5628	54	
5	6.6	1.7410	60	



Calibrated by: (Mr. Supot Salanteh)
RYG Field Services Scientist (1)

Approved by: (Mr. Supot Salanteh)
Field Services Section Head

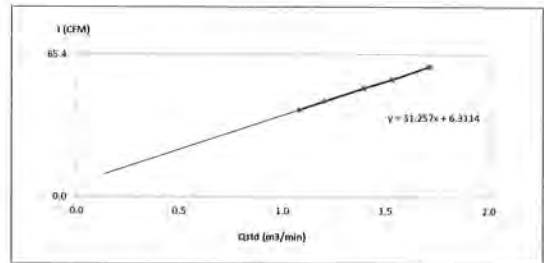
FORM NO.: F-06-073 REVISION NO.: 2 ISSUE DATE: 20/11/23



High Volume Air Sampler Calibration Worksheet

Project Site: Michelin Siam Co., Ltd. Barometric Pressure (mm Hg): 756.3
Calibrate Location: สำนักควบคุมมลพิษภาคกลาง (A2) Temperature (°C): 28.6
Calibrate Date: 28-Sep-25 Calibration Sheet No.: C-280925-RYG_FS0181 High Volume ID: RYG_FS0181
Calibrator ID: RYG_FS0206 High Volume Model: TE-5170D
Calibrator Model: TE-5028A High Volume S/N: 5334
Calibrator S/N: 1543 Calibrator Slope: 1.48469
Calibrator Intercept: -0.02523

Test No.	Delta H ₂ O (Inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.5	1.0812	40	Slope: 31.2568 Intercept: 6.3114 Correlation Coefficient: 0.9990
2	3.1	1.2011	44	
3	4.2	1.3940	50	
4	5.1	1.5335	54	
5	6.4	1.7148	60	



Calibrated by: (Mr. Supot Salanteh)
RYG Field Services Scientist (1)

Approved by: (Mr. Supot Salanteh)
Field Services Section Head

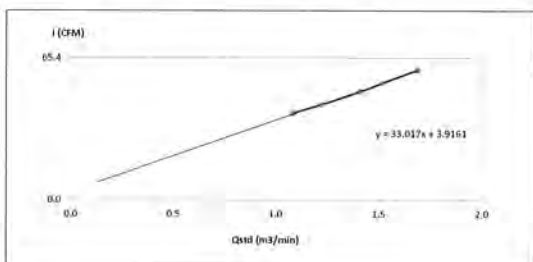
FORM NO.: F-06-073 REVISION NO.: 2 ISSUE DATE: 20/11/23



High Volume Air Sampler Calibration Worksheet

Project Site: Michelin Siam Co., Ltd. Barometric Pressure (mm Hg): 756.3
Calibrate Location: สำนักควบคุมมลพิษภาคกลาง (A3) Temperature (°C): 28.6
Calibrate Date: 28-Sep-25 Calibration Sheet No.: C-280925-RYG_FS0175 High Volume ID: RYG_FS0175
Calibrator ID: RYG_FS0206 High Volume Model: TE-5170D
Calibrator Model: TE-5028A High Volume S/N: 4801
Calibrator S/N: 1543 Calibrator Slope: 1.48469
Calibrator Intercept: -0.02523

Test No.	Delta H ₂ O (Inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.5	1.0812	40	Slope: 33.0171 Intercept: 3.9161 Correlation Coefficient: 0.9989
2	3.2	1.2200	44	
3	4.3	1.4102	50	
4	5.0	1.5186	54	
5	6.2	1.6882	60	



Calibrated by: (Mr. Supot Salanteh)
RYG Field Services Scientist (1)

Approved by: (Mr. Supot Salanteh)
Field Services Section Head

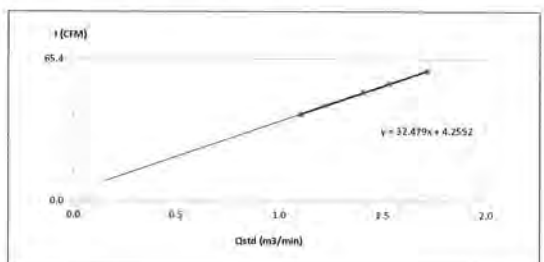
FORM NO.: F-06-073 REVISION NO.: 2 ISSUE DATE: 20/11/23



High Volume Air Sampler Calibration Worksheet

Project Site: Michelin Siam Co., Ltd. Barometric Pressure (mm Hg): 756.3
Calibrate Location: สำนักควบคุมมลพิษภาคกลาง (A4) Temperature (°C): 28.6
Calibrate Date: 28-Sep-25 Calibration Sheet No.: C-280925-RYG_FS0173 High Volume ID: RYG_FS0173
Calibrator ID: RYG_FS0206 High Volume Model: TE-5170D
Calibrator Model: TE-5028A High Volume S/N: 4799
Calibrator S/N: 1543 Calibrator Slope: 1.48469
Calibrator Intercept: -0.02523

Test No.	Delta H ₂ O (Inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.6	1.1021	40	Slope: 32.4792 Intercept: 4.2552 Correlation Coefficient: 0.9999
2	3.2	1.2200	44	
3	4.3	1.4102	50	
4	5.1	1.5335	54	
5	6.4	1.7148	60	



Calibrated by: (Mr. Supot Salanteh)
RYG Field Services Scientist (1)

Approved by: (Mr. Supot Salanteh)
Field Services Section Head

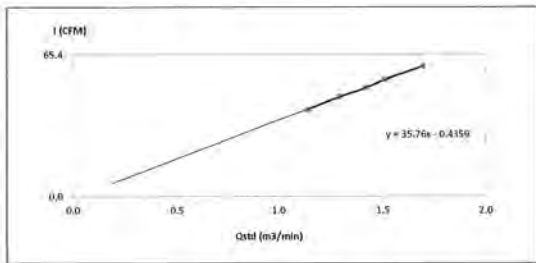
FORM NO.: F-06-073 REVISION NO.: 2 ISSUE DATE: 20/11/23



High Volume Air Sampler Calibration Worksheet

Project Site: Michelin Siam Co., Ltd. Barometric Pressure (mm Hg): 752.0
Calibrate Location: อ่างทอง (A1) Temperature (°C): 31.2
Calibrate Date: 23-Dec-25 High Volume ID: RYG_FS0178
Calibration Sheet No.: C-231225-RYG_FS0178 High Volume Model: TE-S170D
Calibrator ID: RYG_FS0205 High Volume S/N: 4804
Calibrator Model: TE-S028A Calibrator Slope: 1.51825
Calibrator S/N: 1166 Calibrator Intercept: -0.02964

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.9	1.1399	40	Slope: 35.7599 Intercept: -0.4359 Correlation Coefficient: 0.9990
2	3.8	1.2937	46	
3	4.6	1.4204	50	
4	5.2	1.5084	54	
5	6.6	1.6956	60	



Calibrated by: [Signature]
(Mr. Jakkarin Manwicha)
RYG Field Services Scientist (1)

Approved by: [Signature]
(Mr. Supot Salanteh)
Field Services Section Head

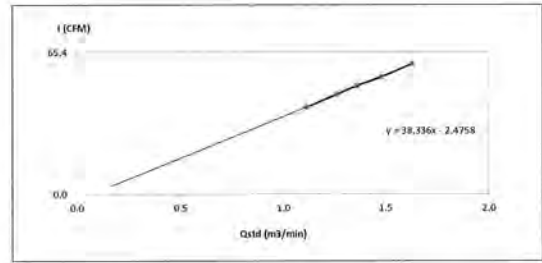
FORM NO. F-06-073 REVISION NO.2 ISSUE DATE: 20/11/23



High Volume Air Sampler Calibration Worksheet

Project Site: Michelin Siam Co., Ltd. Barometric Pressure (mm Hg): 752.0
Calibrate Location: อ่างทอง (A2) Temperature (°C): 31.2
Calibrate Date: 23-Dec-25 High Volume ID: RYG_FS0664
Calibration Sheet No.: C-231225-RYG_FS0664 High Volume Model: TE-S009X
Calibrator ID: RYG_FS0205 High Volume S/N: 6261
Calibrator Model: TE-S028A Calibrator Slope: 1.51825
Calibrator S/N: 1166 Calibrator Intercept: -0.02964

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.8	1.1147	40	Slope: 38.3360 Intercept: -2.4758 Correlation Coefficient: 0.9993
2	3.6	1.2600	46	
3	4.2	1.3586	50	
4	5.0	1.4796	54	
5	6.1	1.6312	60	



Calibrated by: [Signature]
(Mr. Jakkarin Manwicha)
RYG Field Services Scientist (1)

Approved by: [Signature]
(Mr. Supot Salanteh)
Field Services Section Head

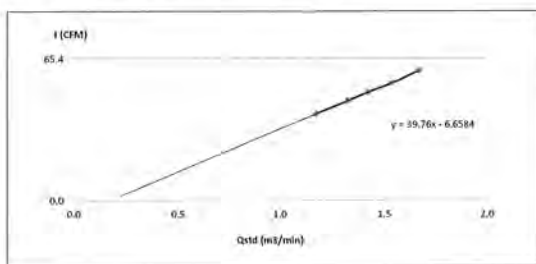
FORM NO. F-06-073 REVISION NO.2 ISSUE DATE: 20/11/23



High Volume Air Sampler Calibration Worksheet

Project Site: Michelin Siam Co., Ltd. Barometric Pressure (mm Hg): 752.0
Calibrate Location: อ่างทอง (A3) Temperature (°C): 31.2
Calibrate Date: 23-Dec-25 High Volume ID: RYG_FS0669
Calibration Sheet No.: C-231225-RYG_FS0669 High Volume Model: TE-S009X
Calibrator ID: RYG_FS0205 High Volume S/N: 6260
Calibrator Model: TE-S028A Calibrator Slope: 1.51825
Calibrator S/N: 1166 Calibrator Intercept: -0.02964

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	3.1	1.1714	40	Slope: 39.7601 Intercept: -6.6584 Correlation Coefficient: 0.9994
2	4.0	1.3266	46	
3	4.6	1.4204	50	
4	5.4	1.5365	54	
5	6.4	1.6701	60	



Calibrated by: [Signature]
(Mr. Jakkarin Manwicha)
RYG Field Services Scientist (1)

Approved by: [Signature]
(Mr. Supot Salanteh)
Field Services Section Head

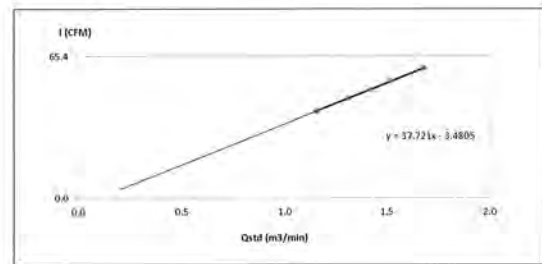
FORM NO. F-06-073 REVISION NO.2 ISSUE DATE: 20/11/23



High Volume Air Sampler Calibration Worksheet

Project Site: Michelin Siam Co., Ltd. Barometric Pressure (mm Hg): 752.0
Calibrate Location: อ่างทอง (A4) Temperature (°C): 31.2
Calibrate Date: 23-Dec-25 High Volume ID: RYG_FS0174
Calibration Sheet No.: C-231225-RYG_FS0174 High Volume Model: TE-S170D
Calibrator ID: RYG_FS0205 High Volume S/N: 4800
Calibrator Model: TE-S028A Calibrator Slope: 1.51825
Calibrator S/N: 1166 Calibrator Intercept: -0.02964

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	3.0	1.1528	40	Slope: 37.7213 Intercept: -3.4805 Correlation Coefficient: 1.0000
2	3.9	1.3102	46	
3	4.6	1.4204	50	
4	5.3	1.5225	54	
5	6.5	1.6829	60	



Calibrated by: [Signature]
(Mr. Jakkarin Manwicha)
RYG Field Services Scientist (1)

Approved by: [Signature]
(Mr. Supot Salanteh)
Field Services Section Head

FORM NO. F-06-073 REVISION NO.2 ISSUE DATE: 20/11/23



Calibration certificate

Calibration Certificate No. 25BK.L0001

Object	Electronic non-automatic weighing instrument	This calibration certificate documents the traceability to national standards.
Manufacturer	Sartorius	Uncertainties of measurements are taken into account when only statements of compliance are made.
Type	LA130S-F	This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP WI 06.
Serial / QM Ident. no.	25409664 RYG_EN0001	This certificate relate and apply this equipment only.
Customer	ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)	
	616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.	
Order no.	2230	
Number of pages	4	
Date of calibration	20 Feb 2025	

REVIEW BY *Thanitak*

APPROVED BY *D. S.*

NEXT CAL DATE: 20/02/26

This calibration certificate may not be reproduced other than in full except with the permission of NSC-TISI-TIS-17025 and the issuing laboratory. Calibration certificates without signature are not valid.

The user is obliged to have the object recalibrated at appropriate intervals.

Date	06 Mar 2025	Approval of the Calibration Certificate	Person in charge
		<i>Mr. Chonichai Inthana</i>	<i>Kachen</i>
		Mr. Chonichai Inthana	Kachen Lalae

Adjustment Status

The measuring device was internally adjusted before the calibration.

Environmental and measuring conditions

Date of calibration	20 Feb 2025
Temperature at place of calibration Temp. diff.	24.5 °C 1.0 K
Twilights - 7 place	
Measuring conditions	The installation site is suitable. The device was levelled. Balance was loaded up to Max before test.
Comments	Humidity 58.0 %RH.

Measurement results | Measurement uncertainties

Repeatability	Eccentricity
Test load (nominal): 10 g 100 g	Test load (nominal): 50 g
10 g	Center
1	Front left
2	Back left
3	Back right
4	Front right
5	Maximum deviation from centric loading indication
6	$ \Delta_{\text{rec}} _{\text{max}} = 0.0001 \text{ g}$
7	
8	
9	
10	
$s = 0.00004 \text{ g}$	$s = 0.00005 \text{ g}$

Testload	Indication	Error	Expansion factor	Uncertainty	Uncertainty relative
L	I	E	k	$U(E)$	$U_{\text{rel}}(E)$
0.0100 g	0.0100 g	0.0000 g	2.00	0.00012 g	1.2 %
0.0500 g	0.0500 g	0.0000 g	2.00	0.00013 g	0.25 %
0.1000 g	0.1000 g	0.0000 g	2.00	0.00013 g	0.13 %
0.5000 g	0.5000 g	0.0000 g	2.00	0.00013 g	0.026 %
1.0000 g	1.0000 g	0.0000 g	2.00	0.00013 g	0.013 %
2.0000 g	2.0000 g	0.0000 g	2.00	0.00013 g	0.0065 %
5.0000 g	5.0000 g	0.0000 g	2.00	0.00013 g	0.0026 %
10.0000 g	10.0000 g	0.0000 g	2.00	0.00013 g	0.0013 %
20.0000 g	20.0000 g	0.0000 g	2.00	0.00014 g	0.00069 %
100.0000 g	100.0000 g	0.0000 g	2.00	0.00021 g	0.00021 %
150.0000 g	149.9998 g	-0.0001 g	2.00	0.00028 g	0.00019 %
Maximum error of indication $ E _{\text{max}} = 0.0001 \text{ g}$					

$U_{\text{rel}}(E)$ is the quotient of $U(E)$ and test load L . The uncertainty of measurement $U(E)$ is valid only if error E is quantified. You will find reference notes on the uncertainty of measurement in use under: Appendix to the calibration certificate | Interpretation of measurement results.

Expansion factor, determined in accordance with the European Calibration Guideline EURAMET cg-16, V4.0. There is a 95 % probability that the value of the measured quantity will be in the assigned value range.

End of calibration certificate

Calibration object

Single range instrument

Model	LA130S-F
Serial Number	25409664
QM Ident. no Inventory no.	RYG_EN0001 —

Maximum capacity (Max. load)	150.0000 g
Measured range	150.0000 g
Scale interval	0.0001 g

Place of calibration

Address	According to page 1
Department Cost center	Laboratory Department —
Building Floor	— 1st Floor
Room	Balance Room
Maximum temperature variation at place of calibration	5 K

Calibration procedure

EURAMET cg-16, V4.0 - Guidelines on the Calibration of Non-Automatic Weighing Instruments

Test equipment

Test equipment type	Test equipment ID	Valid until
Thermometer	MHB-382SD s/nB011342 Traceable to SI unit through DKSH	21 Aug 2025
Test weight set OIML R111 E2	Certificate No.M2308197S_E2(Traceable to SI unit through TCS)	23 Aug 2025

Interpretation of measurement results | Appendix to the calibration certificate

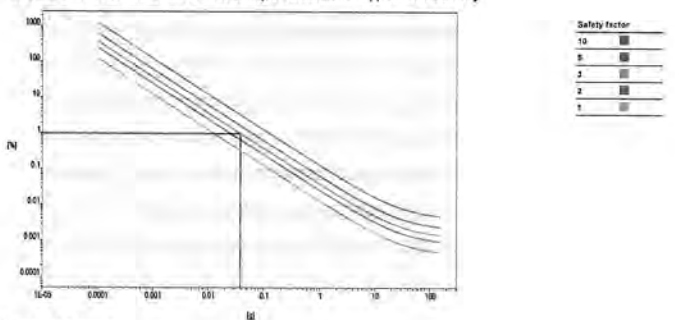
Uncertainty of measurement in use

Device adjusted before measurement	Yes
Temperature deviation considered	1.5 K (isoCAL active)
Temperature coefficient considered	$1 \cdot 10^{-4} \text{ K}$
Uncertainty of the weighing result $U_{\text{rel}}(W)$	$U_{\text{rel}}(W) = 0.00013 \text{ g} + 3.96 \cdot 10^{-4} \cdot R$

Reference note: The current uncertainty of measurement is calculated by inserting of the reading R into this formula. In relation to this, there is no need for a correction of the indication error. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied with an expansion factor of 2, determined in accordance with the European Calibration Guideline EURAMET cg-16, V4.0. There is a 95 % probability that the value of the measured quantity will be in the assigned value range.

Indication in %, from max load	Net indication R	Uncertainty $U_{\text{rel}}(W)$	Uncertainty relative $U_{\text{rel}}(W)_{\text{rel}}$
1 %	1.50000 g	0.00014 g	0.0091 %
25 %	37.5000 g	0.00026 g	0.00074 %
50 %	75.0000 g	0.00043 g	0.00057 %
75 %	112.5000 g	0.00058 g	0.00051 %
100 %	150.0000 g	0.00072 g	0.00048 %

Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example

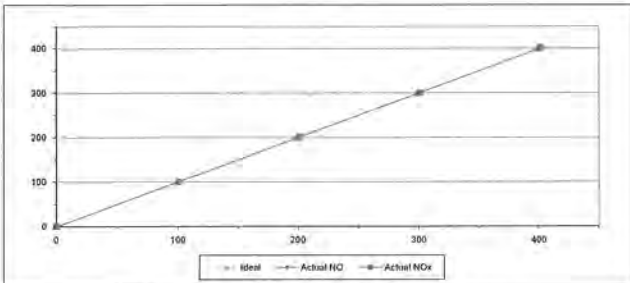
Process accuracy	1.00 %
Safety factor	3
Minimum sample weight	0.0380 g



MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jul-25	Equipment Name	NOx Analyzer
Manufacturer	Teledyne API	Model	T200
Serial No.	7238	Equipment ID	RYG_FS0535
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	99.60	-0.20	-0.20	101.00	1.00	1.00
2	200.00	198.30	-1.70	-0.85	201.30	1.30	0.65
3	300.00	298.50	-1.50	-0.50	301.20	1.20	0.40
4	400.00	398.70	-1.30	-0.33	401.30	1.30	0.33
AVERAGE (%)				-0.36			0.50



Calibrated By

(Mr.Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

ALS Laboratory Group

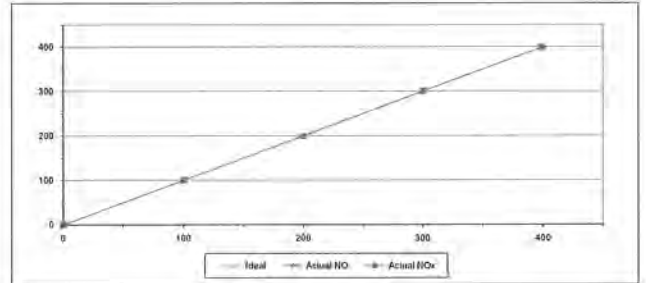
FORM NO.: F-06-056 REVISION NO.: - ISSUE DATE: 02/04/17



MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jul-25	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	NV0ER3YH	Equipment ID	RYG_FS0459
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.05	0.05	0.05	0.10	0.10	0.10
1	100.00	99.50	-0.50	-0.50	101.20	1.20	1.20
2	200.00	198.70	-1.30	-0.65	199.70	-0.30	-0.15
3	300.00	301.10	1.10	0.37	301.00	1.00	0.33
4	400.00	400.30	0.30	0.08	398.80	-1.20	-0.30
AVERAGE (%)				-0.13			0.24



Calibrated By

(Mr.Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

ALS Laboratory Group

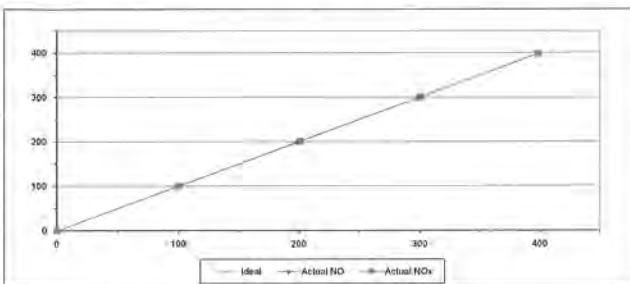
FORM NO.: F-06-056 REVISION NO.: - ISSUE DATE: 02/04/17



MULTIPOINT CALIBRATION REPORT

Calibration Date	1-Jul-25	Equipment Name	NOx Analyzer
Manufacturer	Teledyne API	Model	T200
Serial No.	2198	Equipment ID	RYG_FS0252
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	98.70	-1.30	-1.30	101.00	1.00	1.00
2	200.00	198.20	-1.80	-0.90	201.30	1.30	0.65
3	300.00	298.50	-1.50	-0.50	301.00	1.00	0.33
4	400.00	398.90	-1.10	-0.28	398.60	-1.40	-0.35
AVERAGE (%)				-0.58			0.35



Calibrated By

(Mr.Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

ALS Laboratory Group

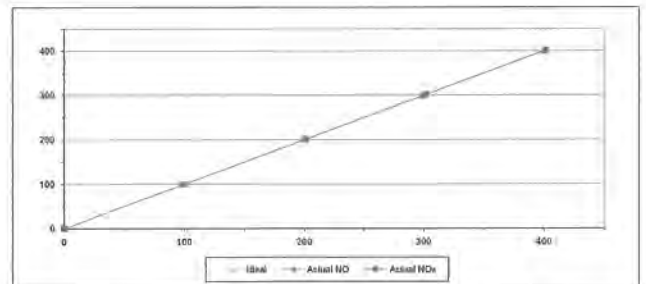
FORM NO.: F-06-056 REVISION NO.: - ISSUE DATE: 02/04/17



MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jul-25	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	T05HWM41	Equipment ID	RYG_FS0481
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	98.70	-1.30	-1.30	100.10	0.10	0.10
2	200.00	201.00	1.00	0.50	201.00	1.00	0.50
3	300.00	298.70	-1.30	-0.43	302.10	2.10	0.70
4	400.00	398.40	-1.60	-0.40	401.60	1.60	0.40
AVERAGE (%)				-0.31			0.36



Calibrated By

(Mr.Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

ALS Laboratory Group

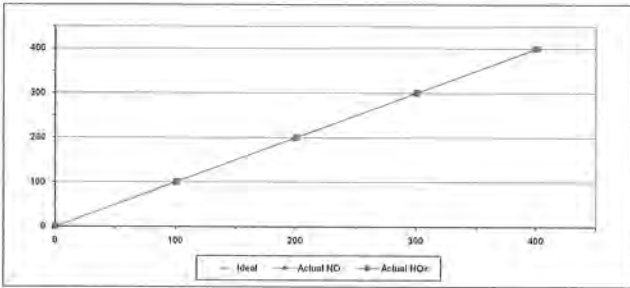
FORM NO.: F-06-056 REVISION NO.: - ISSUE DATE: 02/04/17



MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jul-25	Equipment Name	NOx Analyzer
Manufacturer	Teledyne API	Model	N200
Serial No.	122	Equipment ID	RYG_FS0732
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	99.20	-0.80	-0.80	101.30	1.30	1.30
2	200.00	198.70	-1.30	-0.65	201.30	1.30	0.65
3	300.00	298.80	-1.20	-0.40	301.30	1.30	0.43
4	400.00	398.50	-1.50	-0.38	401.00	1.00	0.25
AVERAGE (%)				-0.43			0.55



Calibrated By

(Mr.Jirawut Sakarn)
Field Environmental Scientist (3)

Approved By

(Mr.Sarayuht Jitranont)
Assistant General Manager

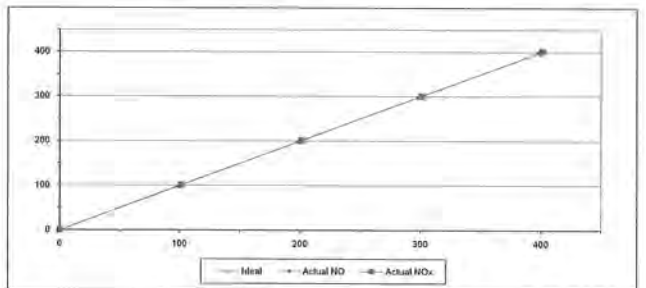
ALS Laboratory Group
FORM NO.: F 06-056 REVISION NO.: ISSUE DATE: 02/04/22



MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jul-25	Equipment Name	NOx Analyzer
Manufacturer	Teledyne API	Model	N200
Serial No.	107	Equipment ID	RYG_FS0731
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	99.00	-1.00	-1.00	101.30	1.30	1.30
2	200.00	198.50	-1.50	-0.75	201.30	1.30	0.65
3	300.00	298.70	-1.30	-0.43	301.00	1.00	0.33
4	400.00	398.80	-1.20	-0.30	401.30	1.30	0.33
AVERAGE (%)				-0.48			0.54



Calibrated By

(Mr.Jirawut Sakarn)
Field Environmental Scientist (3)

Approved By

(Mr.Sarayuht Jitranont)
Assistant General Manager

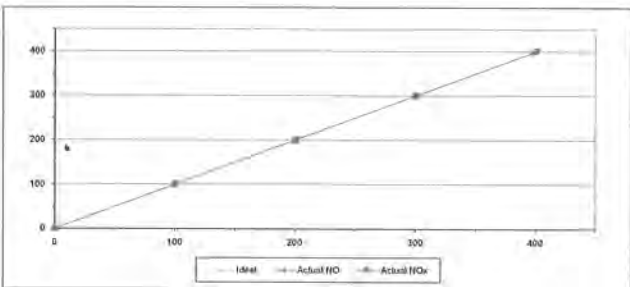
ALS Laboratory Group
FORM NO.: F 06-056 REVISION NO.: ISSUE DATE: 02/04/22



MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jul-25	Equipment Name	NOx Analyzer
Manufacturer	Teledyne API	Model	T200
Serial No.	7238	Equipment ID	RYG_FS0533
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	99.50	-0.50	-0.50	101.10	1.10	1.10
2	200.00	198.90	-1.10	-0.55	201.20	1.20	0.60
3	300.00	298.80	-1.20	-0.40	301.00	1.00	0.33
4	400.00	398.70	-1.30	-0.33	401.50	1.50	0.38
AVERAGE (%)				-0.33			0.50



Calibrated By

(Mr.Jirawut Sakarn)
Field Environmental Scientist (3)

Approved By

(Mr.Sarayuht Jitranont)
Assistant General Manager

ALS Laboratory Group
FORM NO.: F 04-056 REVISION NO.: ISSUE DATE: 02/04/22

INNOVATIVE INSTRUMENT CALIBRATION LAB
INNOVATIVE INSTRUMENT CO., LTD. HEAD OFFICE
713 MOO 11, SUKHUMVIT 11, KLONG TOEY, BANGKOK 10110
AMPHIB, BANACHUANG, SAMUT PRAKAN, PRAKUN 10150, THAILAND
TEL: 0066-2116-5500-1 FAX: 0066-2116-7140



Page 1/1

Certificate of Calibration

Customer: ALS Laboratory Group Thailand Co., Ltd.
Name: ALS Laboratory Group Thailand Co., Ltd.
Address: 104 Soi Phatthanasak 40, Phatthanasak Road, Suan Luang, Bangkok 10250

Certificate No.: 25-AFM-023
Request No.: Req-2025-0169

Unit Under Calibration Details

Measurement Item: Air Flow Meter
Manufacturer: Mass Labs
Model: 700-510L
Serial Number: 110077
ID: RYG_FS0208

Accuracy: 1% of Reading

Sensor Model: -

Sensor Serial Number: -

Instrument Status: Used

Location of Calibration: LAB 4 AIR VELOCITY METER

Calibration Environment and Details

Temperature: 23 °C ± 1 °C
Humidity: 55 %RH ± 20 %RH
Barometric Pressure: 1013 hPa ± 10 hPa
Received Date: 21 January 2025
Calibration Date: 27 January 2025

Calibration Procedure: In-house method CP-AFM-01 by Comparison technique with Standard Primary Flow Calibrator

Reference Standard	Model	Serial Number	Traceable	Due Calibration
Air Flow Meter	Gilibrator 3 Low flow	18501010006	Sensodyne	6 August 2025
Air Flow Meter	Gilibrator 3 Standard flow	19031011003	Sensodyne	7 August 2025
Temperature meter	GT 11	080000357	Quebon	1 March 2025
Pressure meter	CPG2400	410000DU/s13852	TPA	21 October 2025

Traceability: This Certificate is traceable to SI Unit through Sensodyne A7LA Accreditation No. 3943.01

Note:

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor $k=2$, providing a level of confidence approximately 95 %.

Calibration By:

Mr. Noppadol Luangtan
Service Calibration Engineer

Approved By:

Mr. Pacil Mathewven
Calibration Engineer Supervisor

Issue Date: 27 January 2025

Certificate No : 25-AFM-023
Request No : Req 2025-0169

Result of Calibration : Without Adjustment

Temperature (°C)	Pressure (kPa)	STD (cc/min)	UUC (cc/min)	Error (cc/min)	Uncertainty (cc/min)	MPE (cc/min)	Result
22.50	100.90	20	19.854	-0.1	1.3	0.2	Pass1
22.50	100.90	50	49.732	-0.3	3.3	0.5	Pass1
22.60	100.90	101	100.77	-0.2	2.8	1.0	Pass1
22.70	100.90	151	150.23	-0.8	4.2	1.5	Pass1
22.70	100.90	201	200.39	-0.6	5.6	2.0	Pass1
22.70	100.90	301	300.69	-0.3	8.4	3.0	Pass1
22.80	100.90	400	402.96	3.0	11	4.0	Pass1
23.10	100.90	500	504.62	4.6	7.2	5.0	Pass1

Note: STD : Standard UUC : Unit Under Calibration
- UUC Reference Condition : At atmospheric pressure and room temperature condition
- Flow Rate was corrected for non-standard operating condition by using equation :

$$Q_{meas} = Q_{ref} \times \frac{P_{ref}}{P} \times \frac{T_{meas}}{T_{ref}}$$

where Q = Flow Rate P = Absolute Pressure T = Absolute Temperature
Meas = Measurement Condition ref = Standard Condition

* Indicates not accredited

MPE = Maximum Permissible Error (Specified in Manufacturer's Specifications)

N/A = Not Available, Customer does not require a statement of conformity

Certificate No : 25-AFM-023
Request No : Req 2025-0169

Decision Rule for Statements of Conformity

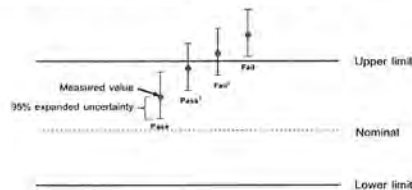
The standard decision rule employed for the statements of conformity to each calibration result will be applied using ILAC-G809/2019, Guidelines on the Reporting of Compliance with Specification as following Fig. and statements

Pass - The measurement result plus the expanded uncertainty with a 95% coverage probability were within the limit.

Pass¹ - The measurement result was within the limit. However, a portion of the expanded uncertainty of measurement at 95% exceeds the limit.

Fail¹ - The measurement result was out of the limit. However, a portion of the expanded uncertainty of measurement at 95% is within the limit.

Fail - The measurement result plus the expanded uncertainty with a 95% coverage probability were outside the limit.



End of Certificate

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

IM-708-AFM-01 Rev.04 Issue date 17/6/24

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

IM-708-AFM-01 Rev.04 Issue date 17/6/24

Certificate of Calibration

Customer: ALS Laboratory Group (Thailand) Co., Ltd.
Name: 104 Soi Phatthanasiri 40, Phatthanasiri Road, Suan Luang,
Address: Bangkok 10250
Certificate No : 24-AFM-179
Request No : Req 2024-1407

Unit Under Calibration Details

Measurement Item: Air Flow Meter
Manufacturer: Messtechnik
Model: D10000510 M
Serial Number: 151114
ID: BKK_F50614
Location of Calibration: LAB 4 AIR VELOCITY ME319
Accessories: 10 of Reading
Sensor Model: -
Sensor Serial Number: -
Instrument Status: Used

Calibration Environment and Details

Temperature: 23 °C ± 1 °C
Humidity: 55 % RH ± 20 % RH
Barometric Pressure: 1013 hPa ± 16 hPa
Received Date: 09 August 2024
Calibration Due: 09 September 2024
Calibration Procedure: In house method CP-AFM-01 by Comparison technique with Standard Primary Flow Calibration

REVIEW BY: *Nguyen P*
APPROVED BY: *Nguyen P*
NEXT CAL. DATE: 9/9/25

Reference Standard	Model	Serial Number	Traceable	Due Calibration
Air Flow Meter	Golden Thread Flow	18501010006	Sensidyne	6 August 2025
Air Flow Meter	Golden Thread Standard Flow	19051041093	Sensidyne	2 August 2025
Temperature sensor	GL 11	00000957	Qeson	1 March 2025
Pressure sensor	CPG2400	410000101051002	TFA	9 November 2024

Traceability:

This certificate is traceable to SI Unit through Measurement: A2L Accreditation No. 293181

Note:

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor (k) = 2, providing a level of confidence approximately 95 %

Calibration By: *Nguyen P*
Mr. Nopadol Eungam
Senior Calibration Engineer

Approved By: *Nguyen P*
Mr. Pich Madheevan
Calibration Engineer Supervisor
Issue Date: 9 September 2024

Certificate No : 24-AFM-179
Request No : Req 2024-1407

Result of Calibration : Without Adjustment

Temperature (°C)	Pressure (kPa)	STD (cc/min)	UUC (cc/min)	Error (cc/min)	Uncertainty (cc/min)	MPE (cc/min)	Result
24.70	100.95	100	100.41	-0.5	2.6	1.0	N/A
24.90	100.90	500	500.47	-0.5	5.1	5.0	N/A
24.90	100.97	1003	1003.3	-3	13	10.0	N/A
25.00	100.92	2004	2009.9	4	29	20.1	N/A
25.20	101.03	3043	3054.3	11	43	30.4	N/A
25.30	101.10	4043	4055.1	11	57	40.4	N/A
25.50	101.15	5052	5061.9	10	74	50.9	N/A

Note: STD : Standard UUC : Unit Under Calibration
- UUC Reference Condition : At atmospheric pressure and room temperature condition
- Flow Rate was corrected for non-standard operating condition by using equation :

$$Q_{meas} = Q_{ref} \times \frac{P_{ref}}{P} \times \frac{T_{meas}}{T_{ref}}$$

where Q = Flow Rate P = Absolute Pressure T = Absolute Temperature
Meas = Measurement Condition ref = Standard Condition

* Indicates not accredited

MPE = Maximum Permissible Error (Specified in Manufacturer's Specifications)

N/A = Not Available, Customer does not require a statement of conformity

Certificate No : 24-AFM-479
Request No : Req-2024-1987

Deviation Rule for Statements of Conformity

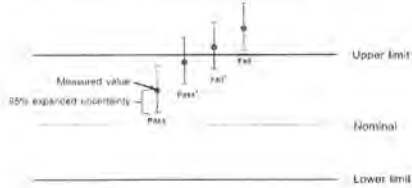
The standard deviation is applied to the statements of conformity to ensure calibration results will be applied using 95% confidence level.

Pass - The measurement result plus the expanded uncertainty with 95% coverage probability was within the limit.

Fail - The measurement result was outside the limit. However, a portion of the expanded uncertainty of measurement is within the limit.

OK - The measurement result was not at the limit. However, a portion of the expanded uncertainty of measurement is within the limit.

Fail - The measurement result plus the expanded uncertainty with 95% coverage probability was outside the limit.



End of Certificate

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-AFM-01 Rev.06 Issue date 21/2/25

Certificate of Calibration

Certificate No : 25-AFM-208
Request No : Req-2025-1986

Customer : ALS Laboratory Group Thailand Co., Ltd.
Name : 101 Soi Phatthanasak 40, Phatthanasak Road, Suan Luang, Bangkok
Address : 10250

Unit Under Calibration Details

Measurement Item : Air Flow Meter
Manufacturer : Metalaabs
Model : 200-510M
Serial Number : 151114
ID : BKK-150614

Sensor Model : -
Sensor Serial Number : -
Instrument Status : Used

Location of Calibration : LAH-4 AIR VELOCITY METER

Calibration Environment and Details

Temperature : 23 °C ± 3 °C
Humidity : 55%RH ± 20%RH
Barometric Pressure : 1013 kPa ± 10 kPa
Received Date : 3 September 2025
Calibration Date : 10 September 2025
Calibration Procedure : In-house method CP-AFM-01 by Comparison technique with Standard Primary Flow Calibrator

REVIEW BY: [Signature]
APPROVED BY: [Signature]
NEXT CAL DATE: 09/09/26

Reference Standard	Model	Serial Number	Traceable	Due Calibration
Air Flow Meter	Calibrator J Low Flow	18501010006	Senodyne	5 May 2026
Air Flow Meter	Calibrator J Standard flow	19031011003	Senodyne	6 May 2026
Temperature meter	G.T. 11	00000057	Qelwuu	15 October 2025
Pressure meter	CPA2400	1100KIDU1651852	TPA	21 October 2025

Traceability :

This Certificate is traceable to SI Unit through Senodyne A2LA Accreditation No. 3943.01 and MET NSC-TIS-115 Accreditation No. 0652

Note :

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor $k = 2$, providing a level of confidence approximately 95 %.

Calibration By : [Signature]
Mr. Nopphon Luangn
Service Calibration Engineer

Approved By : [Signature]
Mr. Pichit Mathavon
Calibration Engineer Supervisor
Issue Date : 10 September 2025

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-AFM-01 Rev.06 Issue date 21/2/25

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-AFM-01 Rev.06 Issue date 21/2/25

Certificate No : 25-AFM-208
Request No : Req-2025-1986

Result of Calibration : Without Adjustment

STD Reading			UUC Reading			Error	Uncertainty	
Temperature (°C)	Pressure (kPa)	Flow (cc/min)	Temperature (°C)	Pressure (kPa)	Flow (cc/min)		(cc/min)	(kPa)
25.5	100.98	100	-	-	100.02	0.0	3.6	1.0
25.7	100.97	503	-	-	500.81	-2.2	9.5	1.0
25.8	100.59	1003	-	-	1000.4	-3	19	1.0
26.1	100.88	2000	-	-	2001.9	2	38	1.0
26.5	100.85	3014	-	-	3002.2	-12	57	1.0
26.7	100.81	4027	-	-	4000.9	-26	76	1.0
27.0	100.71	5048	-	-	5001.8	-46	95	1.0

Note : STD : Standard UUC : Unit Under Calibration
~ UUC Reference Condition : At atmospheric pressure and room temperature condition, Air.
~ Flow Rate (x) is corrected for non-standard operating condition by using equation :

$$Q_{meas} = Q_{ref} \times \frac{P_{ref}}{P_{meas}} \times \frac{T_{meas}}{T_{ref}}$$

where : Q = Flow Rate P = Absolute Pressure T = Absolute Temperature
meas : Measurement Condition ref : Standard Condition

* Indicates non accredited

End of Certificate

Accredited calibration laboratory
ISO/IEC 17025:2017
MSC-TIS-115 12025
CALIBRATION 0367

Air speed measurement laboratory
Calibration services department

Certificate Number
CWS-049-67

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM
MANUFACTURER
MODEL/TYPE

1 Cup anemometer
1 Novolyon
Sensor: WS-Q2A

SERIAL NUMBER

Data logger: L30-WS-2501-D

ID NUMBER

15000000000000000000

CONDITION AS RECEIVED

15000000000000000000

CUSTOMER

15000000000000000000

RECEIVED DATE

12 Sep 2024

MEASUREMENT DATE

18 Sep 2024

ISSUE DATE

01 Oct 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the lab story are as follows:

Temperature : 23.0 ± 3.0 °C

Relative humidity : 55.0 ± 15.0 %RH

Atmospheric Pressure : 1010 ± 10 kPa

PLACE OF CALIBRATION

1 Effel-type wind tunnel of Junanate Associates Co., Ltd.

CALIBRATION CONDITIONS

1 Wind tunnel cross-section area: 900 cm²

1 Wind direction (up): 100 cm²

1 Diameter of mounting pipe: 100 mm

1 Blockage ratio of test object: 0.111

Preconditioning

1 24 hours at ambient conditions.

Measurement Condition

1 The average values during measurement are (27.8) °C, (51.0) %RH and (1007.6) kPa.

TABULATION OF RESULTS:

1 The table on next page give the measured values.

Calibrated by:

1 Mr. Nopphon Luangn

Remarks:

1 1. Hazardous gas/vapour area of the wind tunnel

1 2. Precaution on safety area of the test object (include mounting pipe)

1 3. Reference of mounting pipe

1 4. Note: 1st

J
NAC
JUNANATE ASSOCIATES CO., LTD.

Approved Signature
[Signature]
1. Nopphon Luangn

REVIEW BY: [Signature]
APPROVED BY: [Signature]
NEXT CAL DATE: 18 Mar 2026

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-AFM-01 Rev.06 Issue date 21/2/25

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 3: This equipment was connected with temperature sensor Model: HMP605/PL W250208.
Immersion: Diameter 12 mm, Length 80 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.054	20.0	-0.2	0.10
80	25.054	25.0	-0.3	0.005
80	30.040	29.9	-0.3	0.005
80	35.026	34.9	-0.2	0.005
80	39.025	39.0	-0.2	0.005

UUC's Unit Under Calibration.

Remark 1: The reported uncertainty of measurement is a 95% level standard uncertainty multiplied by a coverage factor k=2.21 providing a level of confidence of approximately 95%.

End of Certificate of Calibration



CERTIFICATE OF CALIBRATION

Certificate No.: CRT-044-67

MEASUREMENT ITEM

Relative humidity with data logger

MANUFACTURER

Novapix

MODEL/TYPE

Data logger: 110 WS-2501-D

SERIAL NUMBER

Sensor: HMP60

ID NUMBER

Data logger: AG08

CONDITION AS RECEIVED

Sensor: W250208

CUSTOMER

New Item

RECEIVED DATE

12 Sep 2024

MEASUREMENT DATE

18 Sep 2024

ISSUE DATE

01 Oct 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature : 23.0 ± 3.0 °C

Relative Humidity : 55.0 ± 15.0 %RH

NOTE: The certificate is valid only to the item calibrated on date and place of calibration

TABULATION OF RESULTS:

The table on next page give the measured values

Calibration procedure:

The Relative Humidity and Air Temperature calibration was done by 9 degree comparison method on W250208 and W250208 according to comparison method with Standard Climate Master Apparatus with temperature control and standard humidity generator chamber.

Traceability:

The calibration was traceable to the International System of Unit (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: 160375-21 and through Standard Reference: 144 Certificate number: 1307-001-01.

Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM (Guidance for the evaluation of measurement uncertainty).

Calibrated by:

1. Mr. S. P. P. P. P. P.
2. Mr. S. P. P. P. P. P.
3. Mr. S. P. P. P. P. P.



Approved signature:

Mr. S. P. P. P. P. P.
Calibration Department Manager

THIS CERTIFICATE REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Measurement Results:

The results of calibration and associated measurement uncertainty are represented in the table below:

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Table 1: The result of 110 WS-2501-D humidity at 23 °C and 55% relative humidity
Calibration Range: 20% to 60% RH

At Temperature (°C)	Standard Reading (%RH)	UUC Reading (%RH)	Error (%RH)	Uncertainty (%RH)
23.0	55.40	55.4	-0.1	0.1
23.0	55.40	55.4	-0.1	0.1
23.0	55.40	55.4	-0.1	0.1

UUC's Unit Under Calibration

End of Certificate of Calibration



CERTIFICATE OF CALIBRATION

Certificate No.: CRT-044-67

MEASUREMENT ITEM

Digital barometer

MANUFACTURER

Novapix

MODEL/TYPE

Agilent: 110 WS-2501-D

SERIAL NUMBER

Data logger: 110 WS-2501-D

ID NUMBER

Sensor: HMP60

CONDITION AS RECEIVED

W250208

CUSTOMER

ALS Laboratory Group (Thailand) Co., Ltd.
101 Phatthana-40, Phatthana-40, Khwaeng Suan Luang,
Khet Suan Luang, Bangkok 10250 Thailand

RECEIVED DATE

12 Sep 2024

MEASUREMENT DATE

18 Sep 2024

ISSUE DATE

01 Oct 2024

CONDITION OF THIS RESULT OF CALIBRATION:

1. Reference: Standard test method.

Instrument: Model

Serial No.

Condition No.

Due Date

Agilent Pressure Transducer

110 WS-2501-D

110 WS-2501-D

01 Oct 2024

1. Calibration Effect for calibration uncertainty:

2. The UUC was made to verify the calibration of the pressure measurement with a level of 0.1% was fully in the calibration level

3. Fully traceable to NIST.

4. Uncertainty

Pressure: 0.0001

0.0001

0.0001

5. The UUC was made to verify the calibration of the pressure measurement with a level of 0.1% was fully in the calibration level

Pressure: 0.0001

0.0001

0.0001

6. The UUC was made to verify the calibration of the pressure measurement with a level of 0.1% was fully in the calibration level

Pressure: 0.0001

0.0001

0.0001

7. The UUC was made to verify the calibration of the pressure measurement with a level of 0.1% was fully in the calibration level

Pressure: 0.0001

0.0001

0.0001

8. The UUC was made to verify the calibration of the pressure measurement with a level of 0.1% was fully in the calibration level

Pressure: 0.0001

0.0001

0.0001

9. The UUC was made to verify the calibration of the pressure measurement with a level of 0.1% was fully in the calibration level

Pressure: 0.0001

0.0001

0.0001

Calibrated by:

1. Mr. S. P. P. P. P. P.
2. Mr. S. P. P. P. P. P.
3. Mr. S. P. P. P. P. P.



Approved signature:

Mr. S. P. P. P. P. P.
Calibration Department Manager

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Certificate Number
CWD-029-67

Page 2 of 2 Pages

MEASUREMENT RESULTS¹

The wind direction sensor was calibrated against standard rotary encoder by comparison method. During calibration, the measurement was carried out at 45° intervals in clockwise and counter-clockwise directions after offset adjustment has been made. The flow speed of wind tunnel (usually 5 m/s) is kept constant while the sensor is rotated around its vertical axis. The results of calibration and associated measurement uncertainties are reported in the table below.

Air speed m/s	D ₁₀₀ Degree (°)	D ₁₀₀ Degree (°)	Error Degree (°)	U (k=2) Degree (°)
5.01	45.000	41	-4	0.80
	90.000	87	-3	0.80
	135.000	134	-1	0.80
	180.000	182	2	0.80
	225.000	230	5	0.80
	270.000	275	5	0.80
	315.000	320	5	0.80
	360.000	359	-1	0.80

Remark:

¹ Calibration results only valid for the tested circumstances and environmental conditions during which calibration took place.

² Direction of standard

³ Direction of first order Calibration

End of Certificate of Calibration



Jirantee Associates Co., Ltd.
63/14-15, 67/22-25
Pachkarn 7, 7/1, 8/1, 9/1, 10/1, 11/1, 12/1, 13/1, 14/1, 15/1, 16/1, 17/1, 18/1, 19/1, 20/1, 21/1, 22/1, 23/1, 24/1, 25/1, 26/1, 27/1, 28/1, 29/1, 30/1, 31/1, 32/1, 33/1, 34/1, 35/1, 36/1, 37/1, 38/1, 39/1, 40/1, 41/1, 42/1, 43/1, 44/1, 45/1, 46/1, 47/1, 48/1, 49/1, 50/1, 51/1, 52/1, 53/1, 54/1, 55/1, 56/1, 57/1, 58/1, 59/1, 60/1, 61/1, 62/1, 63/1, 64/1, 65/1, 66/1, 67/1, 68/1, 69/1, 70/1, 71/1, 72/1, 73/1, 74/1, 75/1, 76/1, 77/1, 78/1, 79/1, 80/1, 81/1, 82/1, 83/1, 84/1, 85/1, 86/1, 87/1, 88/1, 89/1, 90/1, 91/1, 92/1, 93/1, 94/1, 95/1, 96/1, 97/1, 98/1, 99/1, 100/1, 101/1, 102/1, 103/1, 104/1, 105/1, 106/1, 107/1, 108/1, 109/1, 110/1, 111/1, 112/1, 113/1, 114/1, 115/1, 116/1, 117/1, 118/1, 119/1, 120/1, 121/1, 122/1, 123/1, 124/1, 125/1, 126/1, 127/1, 128/1, 129/1, 130/1, 131/1, 132/1, 133/1, 134/1, 135/1, 136/1, 137/1, 138/1, 139/1, 140/1, 141/1, 142/1, 143/1, 144/1, 145/1, 146/1, 147/1, 148/1, 149/1, 150/1, 151/1, 152/1, 153/1, 154/1, 155/1, 156/1, 157/1, 158/1, 159/1, 160/1, 161/1, 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1017/1, 1018/1, 1019/1, 1020/1, 1021/1, 1022/1, 1023/1, 1024/1, 1025/1, 1026/1, 1027/1, 1028/1, 1029/1, 1030/1, 1031/1, 1032/1, 1033/1, 1034/1, 1035/1, 1036/1, 1037/1, 1038/1, 1039/1, 1040/1, 1041/1, 1042/1, 1043/1, 1044/1, 1045/1, 1046/1, 1047/1, 1048/1, 1049/1, 1050/1, 1051/1, 1052/1, 1053/1, 1054/1, 1055/1, 1056/1, 1057/1, 1058/1, 1059/1, 1060/1, 1061/1, 1062/1, 1063/1, 1064/1, 1065/1, 1066/1, 1067/1, 1068/1, 1069/1, 1070/1, 1071/1, 1072/1, 1073/1, 1074/1, 1075/1, 1076/1, 1077/1, 1078/1, 1079/1, 1080/1, 1081/1, 1082/1, 1083/1, 1084/1, 1085/1, 1086/1, 1087/1, 1088/1, 1089/1, 1090/1, 1091/1, 1092/1, 1093/1, 1094/1, 1095/1, 1096/1, 1097/1, 1098/1, 1099/1, 1100/1, 1101/1, 1102/1, 1103/1, 1104/1, 1105/1, 1106/1, 1107/1, 1108/1, 1109/1, 1110/1, 1111/1, 1112/1, 1113/1, 1114/1, 1115/1, 1116/1, 1117/1, 1118/1, 1119/1, 1120/1, 1121/1, 1122/1, 1123/1, 1124/1, 1125/1, 1126/1, 1127/1, 1128/1, 1129/1, 1130/1, 1131/1, 1132/1, 1133/1, 1134/1, 1135/1, 1136/1, 1137/1, 1138/1, 1139/1, 1140/1, 1141/1, 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1267/1, 1268/1, 1269/1, 1270/1, 1271/1, 1272/1, 1273/1, 1274/1, 1275/1, 1276/1, 1277/1, 1278/1, 1279/1, 1280/1, 1281/1, 1282/1, 1283/1, 1284/1, 1285/1, 1286/1, 1287/1, 1288/1, 1289/1, 1290/1, 1291/1, 1292/1, 1293/1, 1294/1, 1295/1, 1296/1, 1297/1, 1298/1, 1299/1, 1300/1, 1301/1, 1302/1, 1303/1, 1304/1, 1305/1, 1306/1, 1307/1, 1308/1, 1309/1, 1310/1, 1311/1, 1312/1, 1313/1, 1314/1, 1315/1, 1316/1, 1317/1, 1318/1, 1319/1, 1320/1, 1321/1, 1322/1, 1323/1, 1324/1, 1325/1, 1326/1, 1327/1, 1328/1, 1329/1, 1330/1, 1331/1, 1332/1, 1333/1, 1334/1, 1335/1, 1336/1, 1337/1, 1338/1, 1339/1, 1340/1, 1341/1, 1342/1, 1343/1, 1344/1, 1345/1, 1346/1, 1347/1, 1348/1, 1349/1, 1350/1, 1351/1, 1352/1, 1353/1, 1354/1, 1355/1, 1356/1, 1357/1, 1358/1, 1359/1, 1360/1, 1361/1, 1362/1, 1363/1, 1364/1, 1365/1, 1366/1, 1367/1, 1368/1, 1369/1, 1370/1, 1371/1, 1372/1, 1373/1, 1374/1, 1375/1, 1376/1, 1377/1, 1378/1, 1379/1, 1380/1, 1381/1, 1382/1, 1383/1, 1384/1, 1385/1, 1386/1, 1387/1, 1388/1, 1389/1, 1390/1, 1391/1, 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1517/1, 1518/1, 1519/1, 1520/1, 1521/1, 1522/1, 1523/1, 1524/1, 1525/1, 1526/1, 1527/1, 1528/1,

Certificate Number
CWD-002-68

Page 2 of 2 Pages

MEASUREMENT RESULTS¹

The wind direction sensor was calibrated against standard rotary encoder by comparison method. During calibration, the measurement was carried out at 45° intervals in clockwise and counter-clockwise directions after offset adjustment has been made. The flow speed of wind tunnel fan was 5 m/s to keep constant while the sensor is rotated around its vertical axis. The results of calibration and associated measurement uncertainties are reported in the table below.

Air speed m/s	D ₁ ² Degree (°)	D ₂ ² Degree (°)	Error Degree (°)	U (k=2) Degree (°)
5.01	45.000	45	-4	0.80
	90.000	87	-3	0.80
	135.000	132	-3	0.80
	180.000	181	1	0.80
	225.000	229	4	0.80
	270.000	274	4	0.80
	315.000	318	3	0.80
	360.000	359	-1	0.80

Remark:

¹ Calibration results only cover for the tested circumstances and environmental conditions during which calibration took place.

² Direction of standard.

³ Direction of this under Calibration.

End of Certificate of Calibration



Jiranatee Associates Co., Ltd.
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Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TIS 115.17025
CALIBRATION 0367

Air speed measurement laboratory
Calibration services department



Certificate Number
CWS-052-67

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM

MANUFACTURER

MODEL/TYPE

SERIAL NUMBER

ID NUMBER

CONDITION AS-RECEIVED

CUSTOMER

RECEIVED DATE

MEASUREMENT DATE

ISSUE DATE

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follows:

Temperature

Relative Humidity

Atmospheric Pressure

PLACE OF CALIBRATION

CALIBRATION CONDITIONS

Wind tunnel cross-section area¹

Wind direction fixture angle²

Diameter of mounting pipe³

Blockage ratio of test object⁴

Preconditioning

Measurement Condition

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

(1) Mr. Somchai Thirapong

(2) Miss Siraporn Lertpradit

Remark:

¹ Actual cross-section area of the wind tunnel.

² Proposed cross-section area of the tested object include mounting pipe.

³ Diameter of mounting pipe.

⁴ Ratio (%)

Calibration procedure:

The Cup anemometer was calibrated against standard air velocity transducer against 45°/122 and pilot tube with precision differential pressure meter model: DP42500 in an open reflection of 180° type wind tunnel with 100 cm² cross section area. The V01.0.002 based on IEC 60520:2012, Wind energy generation systems - Part 12-2: Power performance measurements of electricity producing wind turbines. March 2017 was used as a calibration guideline.

Traceability:

This certificate provides a traceability of the measurement to recognize the national standards and to realization of the international system of units (SI) through the NIST National Measurement Institute of Thailand via Certificate Number: MW-0001-24 and MW-0005-21.

Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM Evaluation of measurement data - Guide to the expression of uncertainty in measurement.

REVIEW BY	<i>[Signature]</i>
APPROVED BY	<i>[Signature]</i>
NEXT CAL DATE	4/4/26

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Certificate Number
CWS-052-67

Page 2 of 2 Pages

MEASUREMENT RESULTS¹

The Cup anemometer, Unit Under Calibration (UUC) was exercised at 10 m/s for 5 minutes prior to calibration being performed. The standard air velocity 0.5 m/s to 5 m/s was calculated by a standard air velocity transducer which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of this test section and the standard air velocity 0 m/s to 30 m/s was calculated by a pilot tube with precision differential pressure meter which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section. UUC was mounted on a round vertical tube of the power plate at center of test section. The calibration was carried out under both strong and falling air velocity in the range of 1 m/s to 18 m/s at calibration interval of 1 m/s. The results of calibration and associated measurement uncertainties are reported in the table below.

V _{ref} m/s	Temp. wind tunnel °C	Temp. room °C	V _{meas} m/s	Error m/s	U (k=2) m/s
1.018	23.26	23.30	0.8	-0.2	0.31
2.237	23.24	23.30	2.0	-0.2	0.31
3.051	23.28	23.30	3.0	-0.1	0.31
4.204	23.26	23.30	4.0	-0.2	0.31
8.56	23.92	23.30	5.0	0.0	0.31
5.58	23.70	23.30	6.0	0.0	0.31
7.05	22.84	23.30	7.0	0.0	0.31
7.68	22.58	23.30	8.0	0.0	0.31
8.57	23.00	23.30	9.0	0.0	0.31
9.57	22.96	23.30	10.0	0.1	0.31
11.03	23.30	23.30	11.2	0.2	0.31
12.69	22.94	23.30	12.1	0.1	0.31
13.35	23.70	23.30	13.2	0.2	0.31
13.78	23.04	23.30	14.2	0.3	0.31
14.86	23.20	23.30	15.1	0.2	0.31
15.91	23.14	23.30	16.2	0.3	0.31

Remark:

¹ Calibration results only cover for the tested circumstances and environmental conditions during which calibration took place.

² Velocity of standard.

³ Values of this under Calibration.

PHOTO OF CALIBRATION SET-UP



Calibration set-up of the Cup anemometer calibration in the wind tunnel of Jiranatee Associates Co., Ltd. The Cup anemometer shown may differ from the calibrated one. Remark: The position of the set-up must be true to spherical symmetry.

End of Certificate of Calibration



Jiranatee Associates Co., Ltd.
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Web site: www.jiranatee.com

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TIS 115.17025
CALIBRATION 0367

Wind direction measurement laboratory
Calibration services department



Certificate Number
CWD-052-67

CERTIFICATE OF CALIBRATION

Page 3 of 2 Pages

MEASUREMENT ITEM

MANUFACTURER

MODEL/TYPE

SERIAL NUMBER

ID NUMBER

CONDITION AS-RECEIVED

CUSTOMER

RECEIVED DATE

MEASUREMENT DATE

ISSUE DATE

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follows:

Temperature

Relative Humidity

Atmospheric Pressure

PLACE OF CALIBRATION

CALIBRATION CONDITION

Wind tunnel cross-section area¹

Wind direction fixture angle²

Diameter of mounting pipe³

Blockage ratio of test object⁴

Preconditioning

Measurement Condition

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

(1) Mr. Somchai Thirapong

(2) Miss Siraporn Lertpradit

Remark:

¹ Actual cross-section area of the wind tunnel.

² Proposed cross-section area of the tested object include mounting pipe.

³ Diameter of mounting pipe.

⁴ Ratio (%)

Calibration procedure:

The wind direction sensor was calibrated against standard rotary encoder against 45°/122 and pilot tube with precision differential pressure meter model: DP42500 in an open reflection of 180° type wind tunnel with 100 cm² cross section area. The V01.0.002 based on IEC 60520:2012, Wind energy generation systems - Part 12-2: Power performance measurements of electricity producing wind turbines. March 2017 was used as a calibration guideline.

Traceability:

This certificate provides a traceability of the measurement to recognize the national standards and to realization of the international system of units (SI) through the NIST National Measurement Institute of Thailand via Certificate Number: DW-0001-24.

Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM Evaluation of measurement data - Guide to the expression of uncertainty in measurement.

REVIEW BY	<i>[Signature]</i>
APPROVED BY	<i>[Signature]</i>
NEXT CAL DATE	4/4/26

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

MEASUREMENT RESULTS¹

The wind direction sensor was calibrated against standard rotary encoder by comparison method. During calibration, the measurement was carried out at 45° intervals in clockwise and counter-clockwise directions after either adjustment has been made. The flow speed of wind tunnel (velocity 5 m/s) is kept constant while the sensor is rotated around its vertical axis. The results of calibration and associated measurement uncertainties are reported in the table below.

Air speed m/s	D _{air} Degree (°)	D _{ref} Degree (°)	Error Degree (°)	U (k=2) Degree (°)
	0.000	0	0	0.80
	45.000	42	-3	0.80
	90.000	87	-3	0.80
	135.000	133	-2	0.80
	180.000	178	-2	0.80
	225.000	224	-1	0.80
	270.000	273	3	0.80
	315.000	318	3	0.80

Remark:

¹ Calibration results only valid for the tested circumstances and environmental conditions during which calibration took place.

² Direction of standard.

³ Direction of test under calibration.

End of Certificate of Calibration

MEASUREMENT RESULTS¹

The Cup anemometer, Vent Under Calibration (VUC) was exercised at 10 m/s for 5 minutes prior to calibration being performed. The standard air velocity 0.5 m/s to 5 m/s was calculated by a standard air velocity transducer which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section and the standard air velocity 5 m/s to 30 m/s was calculated by a pitot tube with pressure differential pressure meter which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section. VUC was exercised on a round vertical plate of the lower plate at center of test section. The calibration was carried out under both rising and falling air velocity in the range of 1 m/s to 16 m/s at calibration interval of 1 m/s. The results of calibration and associated measurement uncertainties are reported in the table below.

V _{ref} (m/s)	Temp. wind tunnel (°C)	Temp. room (°C)	V _{air} (m/s)	Error (m/s)	U (k=2) (m/s)
0.997	24.78	24.45	0.8	-0.2	0.31
2.014	24.20	24.45	1.8	-0.2	0.31
2.550	24.80	24.45	2.9	-0.1	0.31
4.102	24.80	24.45	3.8	0.3	0.31
4.97	24.80	24.45	5.0	0.0	0.31
5.38	24.50	24.45	5.0	0.0	0.31
7.93	24.70	24.45	7.1	0.1	0.31
9.25	24.36	24.45	8.1	0.1	0.31
9.84	24.70	24.45	9.1	0.1	0.31
9.98	24.36	24.45	10.2	0.2	0.31
10.99	24.80	24.45	11.2	0.2	0.31
12.63	24.40	24.45	12.2	0.2	0.31
12.57	24.70	24.45	13.2	0.2	0.31
14.10	24.50	24.45	14.3	0.2	0.31
15.03	24.70	24.45	15.2	0.0	0.31
15.99	24.58	24.45	16.2	0.2	0.31

Remark:

¹ Calibration results only valid for the tested circumstances and environmental conditions during which calibration took place.

² Velocity of standard.

³ Velocity of test under calibration.

PHOTO OF CALIBRATION SET-UP



Calibration setup of the Cup anemometer in the wind tunnel of Jiraratsee Associates Co., Ltd. The Cup anemometer shows only after the test is completed. Remark: The proportion of the set-up is just for scale illustration only.

End of Certificate of Calibration

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TIS-TIS 17025
CALIBRATION 0367

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TIS-TIS 17025
CALIBRATION 0367

Wind direction measurement laboratory
Calibration services department

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TIS-TIS 17025
CALIBRATION 0367

Certificate Number

CWS-025-67

CERTIFICATE OF CALIBRATION

MEASUREMENT ITEM

Cup anemometer

Nowlyna

Sensor: WS-02F

Data logger: 110 WS-250L-D

Sensor: WS0-AS099

Data logger: AS099

Sensor: WS0-AS099

Data logger: AS099

Sensor: WS0-AS099

Data logger: AS099

Sensor: WS0-AS099

Data logger: AS099

Sensor: WS0-AS099

Data logger: AS099

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Sensor: WS0-AS0

Certificate Number
CWD 025-67

Page 2 of 2 Pages

MEASUREMENT RESULTS¹

The wind direction sensor was calibrated against standard rotary encoder by comparison method. During calibration, the measurement was carried out at 45° intervals in clockwise and counterclockwise directions after offset adjustment has been made. The flow speed of wind tunnel (usually 5 m/s) is kept constant while the sensor is rotated around its vertical axis. The results of calibration and associated measurement uncertainties are reported in the table below.

Air speed	D ₁₀₀	D ₁₀₀	Error	U (k=2)
m/s	Degree (°)	Degree (°)	Degree (°)	Degree (°)
	0.000	0	0	0.80
	45.000	45	-4	0.80
	90.000	87	-3	0.80
5.04	135.000	132	-3	0.80
	180.000	178	-2	0.80
	225.000	225	0	0.80
	270.000	272	2	0.80
	315.000	319	4	0.80

Remarks:

¹ Calibration results only valid for the tested circumstances and environmental conditions during which calibration took place.

* Direction of standard

Direction of Unit Under Calibration

End of Certificate of Calibration



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JIRANATEE ASSOCIATES PCLTD.

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Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TIS-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department



CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

Certificate No. : CDT-120-67

MEASUREMENT ITEM : Data Logger with Temperature sensor
MANUFACTURER : Novolyte
MODEL/TYPE : 110-W5-250L-D
SERIAL NUMBER : A5009
ID NUMBER : RYG_050608
CONDITION AS-RECEIVED : Used item
CUSTOMER : ALS Laboratory group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khuwaeng Suan Luang, Khwaeng Suan Luang,
Bangkok 10250 Thailand

RECEIVED DATE : 08 Jul 2024
MEASUREMENT DATE : 18 Jul 2024
ISSUE DATE : 18 Jul 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibration procedure:
The temperature calibration was done by In-House calibration method as per ISO 1001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale was based on ITS-90.

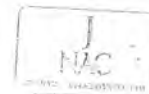
Traceability:
The measurement results are traceable to the International System of units (SI) through National Institute of Metrology Thailand (NIMT).
Certificate number: 17-0047-24, Certificate Number: EA-0101-23

Reference Used During Calibration:

1. Standard Temperature Probe
Model: STS-100 AS100, Serial No.: 667682-09,
Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTI-1000 A MK II, Serial No.: 67407-00591 Due date: 14 Sep 2024

Uncertainty of Measurement:
The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM Evaluation of measurement data. Guide to the expression of uncertainty in measurement.

Calibrated by:
[1] Mr. Sanyat Thachachid
[2] Mr. Jiraporn Lertsomphol
[3] Mr. Rungnirun Phrommet



Approved signature:
Mr. Pariny Booncharoen
Calibration Department Manager

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Continuation of Certificate of Calibration Number CDT-120-67

Page 2 of 2 Pages

Results of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

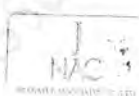
Table 3: This equipment was connected with temperature sensor Model: HMP60 S/N: U3641220.
Dimension: Diameter 12 mm, Length 80 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.047	19.8	-0.2	0.099
80	25.043	24.8	-0.2	0.099
80	30.034	29.8	-0.2	0.099
80	35.028	34.8	-0.2	0.099
80	40.018	39.7	-0.3	0.16

UUC: Unit Under Calibration

Remarks: The reported uncertainty of measurement is 0.16, based on standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

End of Certificate of Calibration



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Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TIS-TIS 17025
CALIBRATION 0367

Relative humidity and Air Temperature measurement laboratory
Calibration services department

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

Certificate No. : CRT-022-67

MEASUREMENT ITEM : Relative humidity with data logger
MANUFACTURER : Novolyte
MODEL/TYPE : Data Logger: 110-W5-250L-D
SERIAL NUMBER : Sensor: HMW40
Data Logger: A0909
ID NUMBER : Sensor: U3641220
RYG_050608
CONDITION AS-RECEIVED : Used item
CUSTOMER : ALS Laboratory group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd., Khuwaeng Suan Luang,
Khwaeng Suan Luang, Bangkok 10250 Thailand

RECEIVED DATE : 08 Jul 2024
MEASUREMENT DATE : 18 Jul 2024
ISSUE DATE : 18 Jul 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibration procedure:
The relative humidity and Air Temperature calibration was done by In-House calibration method as per ISO 1001 according to comparison method with Standard Global Area Humidity generator with temperature probe and standard Humidity generator chamber.

Traceability:
The measurement results are traceable to the International System of units (SI) through National Institute of Metrology Thailand (NIMT).
Certificate number: 16-0170-23 and 16-0170-23
Associated Co., Ltd. Certificate number: 16-0170-23

Uncertainty of Measurement:
The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM Evaluation of measurement data. Guide to the expression of uncertainty in measurement.

Calibrated by:
[1] Mr. Sanyat Thachachid
[2] Mr. Jiraporn Lertsomphol
[3] Mr. Rungnirun Phrommet



Approved signature:
Mr. Pariny Booncharoen
Calibration Department Manager

THIS CERTIFICATE REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Measurement Result:

The results of calibration and associated measurement uncertainties are reported in the table below.

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Table 1: The results of calibration of relative humidity at 25°C are reported in the table below.
Calibration Range: 20.000 to 80.000%

Air Temperature (°C)	Standard Reading (NMI)	UNC Reading (NMI)	Error (NMI)	Uncertainty (95%)
25.78	75.81	13.5	-1.8	0.83
25.83	50.54	47.3	>0.0	1.3
25.61	81.68	77.3	-4.3	2.3

UNC: Unc 100% (k=2) (200%)

End of Certificate of Calibration



Certificate of Calibration

Customer

Name : ALS Laboratory Group Thailand Co., Ltd.
Address : 104 Soi Phatthanakan 40, Phatthanakan Road, Suan Luang,
Bangkok 10250

Certificate No : 25-ACT-042
Request No : Req-2025-0604

Unit Under Calibration Details

Measurement Item : Acoustic Calibrator
Manufacturer : RION
Model : NC-75
Serial Number : 35002736
ID : RVG JS0496

Class : 1
Range : 94 dB / 1000 Hz
Instrument Status : Used

Calibration Environment and Details

Temperature : (23 ± 2 °C)
Humidity : (50 ± 20 %RH)
Barometric Pressure : (1013 ± 10.0 hPa)
Received Date : 6 March 2025
Calibration Date : 19 March 2025
Location of Calibration : LAH 1 Acoustic

Calibration Procedure : In-house method CP-ACT-02 based on IEC 60942:2017 Electroacoustics - Sound calibrators

Reference Standard	Model	Serial Number	Traceable	Due Calibration
Sound Calibrator	SV 35A	58079	FEI	12 June 2025
THD Multimeter	2015	1047765	NIMT	4 February 2026

Traceability : This certificate provides traceability of measurement to recognized national standard, and to the realization of the international System of Units (SI)

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor $k=2$, providing a level of confidence approximately 95 %.

Calibrated By :
Mr. Noppadol Luangart
Service Calibration Engineer

Approved By :
Mr. Pait Mathavorn
Calibration Engineer Supervisor
Issue Date : 19 March 2025

This result is valid only in the scope of calibration. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

TM-708-ACT-02 Rev.03 Issue Date 5/10/24



Certificate No : 25-ACT-042
Request No : Req-2025-0604

Sound pressure level

Calibration Results : Without Adjustment

Calibration Range (dB)	Without Adjustment (dB)		Adjustment (dB)		Uncertainty (± dB)	Acceptance limit Class 1 (± dB)	Result
	Measured	Deviated value	Measured	Deviated value			
94 dB / 1000 Hz	94.06	0.06	-	-	0.13	0.25	Pass

Frequency of Sound pressure level

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty (± %)	Acceptance limit Class 1 (± %)	Result
	Measured (Hz)	Deviated	Measured (Hz)	Deviated			
94 dB / 1000 Hz	1000.00	0.00	-	-	0.01	0.70	Pass

Total Harmonic Distortion plus Noise of Sound pressure level (THD+N %)

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty (± %)	Acceptance limit Class 1 (± %)	Result
	Measured (%)	Measured (%)	Measured (%)	Measured (%)			
94 dB / 1000 Hz	0.98	-	-	-	0.30	2.5	Pass

Note :

Function	Maximum-permitted Uncertainty of measurement
Sound pressure level	0.15 dB
Frequency	0.20%
Total distortion+noise	0.50%

Acceptance limit was IEC 60942:2017 Class 1

The calibration results exclude the calibration reference correction.

The calibration results exclude the microphone volume correction.



Certificate No : 25-ACT-042
Request No : Req-2025-0604

Decision Rule for Statements of Conformity

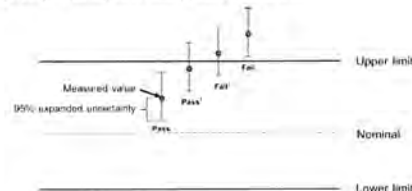
The standard decision rule employed for the statements of conformity to each calibration result will be applied using IEC 60942:2017 (Guidelines for the Reporting of Compliance with Specifications as follows (i.e. and statements)

Pass - The measurement result plus the expanded uncertainty with a 95% coverage probability may exceed the limit.

Pass - The measurement result lies within the limit. However, a portion of the expanded uncertainty of measurement at 95% is within the limit.

Fail - The measurement result was out of the limit. However, a portion of the expanded uncertainty of measurement at 95% is within the limit.

Fail - The measurement result plus the expanded uncertainty with a 95% coverage probability may exceed the limit.



Cert. No. : ACL25086
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No. : 0122578 / 143842 / 74027
ID No. : RYG_FS0017

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 07 JANUARY 2025
Calibration Date : 27 JANUARY 2025
Date of Issue : 28 JANUARY 2025

REVIEW BY : *S.T.S.*
APPROVED BY : *[Signature]*
NEXT CAL DATE : 27-01-2026

Calibrated by : Nathakorn Pisutpaisan

Approved by : *[Signature]*
(Thanakul Petchurai)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced
other than in full, except with the prior written approval of the head of Calibration Laboratory.

Cert. No. : ACL25086
Job No. : VC68AC0059
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long-term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL-BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220016	EEL-BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL-BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977990	AA-1003-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.

3. This certificate is traceable to the international system of unit maintained at :

- 3.1 National Institute of Metrology (Thailand).
3.2 Thailand Institute of Scientific and Technological Research (TISTR).

Cert. No. : ACL25086
Job No. : VC68AC0059
Page : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
17.6

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A-weight	11.6
C-weight	17.5
Flat	23.3

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 94 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.5	0.5	0.5	±1.5
1000	0.1	0.1	0.1	±1.0
8000	0.2	0.2	0.2	±1.0

Cert. No. : ACL25086
Job No. : VC68AC0059
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	0.1	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.0	0.0	± 0.2
C-weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long-term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.0	0.0	± 0.3

T. Petch

Cert. No. : ACL25086
Job No. : VC68AC0059
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	78.9	-0.1	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	63.9	-0.1	± 1.1
59.0	59.0	0.0	± 1.1
54.0	53.9	-0.1	± 1.1
49.0	48.9	-0.1	± 1.1
44.0	43.9	-0.1	± 1.1
39.0	38.9	-0.1	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.2	0.2	± 1.1

T. Petch

Cert. No. : ACL25086
Job No. : VC68AC0059
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Th (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; 2.5
	300	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; 2.5
	200	800	128.0	128.0	0.0	±1.0

Cert. No. : ACL25086
Job No. : VC68AC0059
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.3	-0.1	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.5	-0.1	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$
or any value following calculation providing a level of confidence of approximately 95 %

End of Calibration Certificate

T. Petch

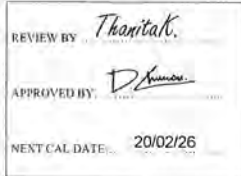
T. Petch



Calibration certificate

Calibration Certificate No. 25BKL0006

Object	Electronic non-automatic weighing instrument	This calibration certificate documents the traceability to national standards.
Manufacturer	Sartorius	Uncertainties of measurements are taken into account when only statements of compliance are made.
Type	MSE125P-100-DU	This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP WI 08.
Serial QM Ident. no.	33108993 RYG_EN0004	This certificate relate and apply this equipment only.
Customer	ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)	
	616/110 Moo 5 T.Moenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.	
Order no.	2230	
Number of pages	4	
Date of calibration	20 Feb 2025	



This calibration certificate may not be reproduced other than in full except with the permission of NSC-TISI-TIS-17025 and the issuing laboratory. Calibration certificates without signature are not valid.
The user is obliged to have the object recalibrated at appropriate intervals.

Date	06 Mar 2025	Approval of the Calibration Certificate	Person in charge
		Mr. Chonchai Inthana	Kachen Lalee

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang
10310 BangkokVerica®
Version 6.5

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Calibration certificate No. 25BKL0006

Calibration Certificate

Adjustment Status

The measuring device was internally adjusted before the calibration

Environmental and measuring conditions

Date of calibration	20 Feb 2025
Temperature at place of calibration Temp. diff.	24.2 °C 0.3 K
Twilight - Time	
Measuring conditions	The installation site is suitable: The device was levelled. Balance was loaded up to Max before test.
Comments	Humidity 52.5 %RH.

Measurement results | Measurement uncertainties

Repeatability		Eccentricity	
Test load (nominal): 50 g 100 g		Test load (nominal): 50 g	
1 50.00002 g 100.00000 g		Center 50.00002 g	
2 50.00001 g 100.00000 g		Front left 50.00000 g	
3 50.00003 g 100.00000 g		Back left 50.00000 g	
4 50.00002 g 100.00000 g		Back right 50.00001 g	
5 50.00001 g 100.00000 g		Front right 50.00003 g	
6 50.00002 g 99.99999 g		Maximum deviation from centre loading indication	
7 50.00002 g 100.00000 g		Δloadmax = 0.00002 g	
8 50.00001 g 100.00000 g			
9 50.00001 g 100.00000 g			
10 50.00002 g 100.00000 g			
s = 0.000007 g s = 0.00003 g			

Testload	Indication	Error	Expansion factor	Uncertainty	Uncertainty relative
L	I	E	k	U(E)	U _{rel} (E)
0.01000 g	0.01000 g	0.00000 g	2.00	0.000024 g	0.24 %
0.10000 g	0.10000 g	0.00000 g	2.00	0.000037 g	0.037 %
1.00000 g	1.00000 g	0.00000 g	2.00	0.000037 g	0.0037 %
5.00002 g	5.00002 g	0.00000 g	2.00	0.000050 g	0.0010 %
20.00002 g	20.00002 g	0.00000 g	2.00	0.000069 g	0.00034 %
55.00004 g	55.00003 g	-0.00001 g	2.00	0.00017 g	0.00031 %
70.00000 g	70.00000 g	0.00000 g	2.00	0.00017 g	0.00024 %
80.00001 g	80.00001 g	0.00000 g	2.00	0.00018 g	0.00023 %
100.00000 g	100.00000 g	0.00000 g	2.00	0.00017 g	0.00017 %
110.00000 g	110.00000 g	0.00000 g	2.00	0.00028 g	0.00025 %
120.00000 g	119.99999 g	-0.00001 g	2.00	0.00028 g	0.00023 %
Maximum error of indication		E _{max} = 0.00010 g			

U_{rel}(E) is the quotient of U(E) and test load L. The uncertainty of measurement U(E) is valid only if error E is considered. You will find reference notes on the uncertainty of measurement in each unit. Applies to the calibration certificate interpretation of measurement results.
Reference note: The reported expanded uncertainty of measurement is stated as a standard uncertainty of measurement multiplied by the documented Expansion factor, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.2. There is a 95 % probability that the value of the measurement will be in the assigned value range.

End of calibration certificate

Calibration object

Multi Interval Instrument

Model	MSE125P-100-DU
Serial Number	33108993
QM Ident. no Inventory no.	RYG_EN0004 —
Range	1' 2'
Maximum capacity (Max. load)	60.00000 g 120.0000 g
Measured range	60.00000 g 120.0000 g
Scale interval	0.00001 g 0.0001 g

Place of calibration

Address	According to page 1
Department Cost center	Laboratory Department. —
Building Floor	— 1st Floor
Room	Balance Room
Maximum temperature variation at place of calibration	5 K

Calibration procedure

EURAMET cg-18, V4.0 - Guidelines on the Calibration of Non-Automatic Weighing Instruments

Test equipment

Test equipment type	Test equipment ID	Valid until
Thermometer	MH8-362SD s/nB011342 Traceable to SI unit through DKSH	21 Aug 2025
Test weight set OIML R111 E2	Certificate No.M2308197S_E2(Traceable to SI unit through TCS)	23 Aug 2025

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Interpretation of measurement results | Appendix to the calibration certificate

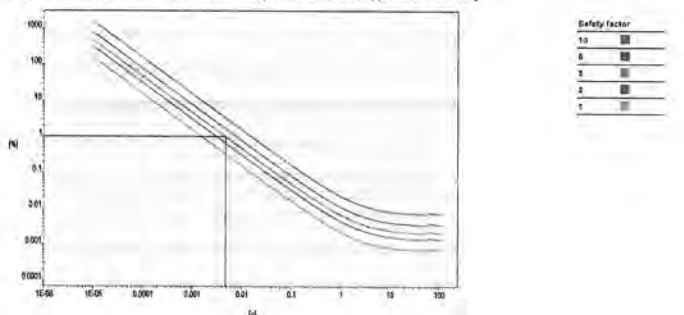
Uncertainty of measurement in use

Device adjusted before measurement	Yes
Temperature deviation considered	1.5 K (isoCAL active)
Temperature coefficient considered	1 · 10 ⁻⁴ %K
Uncertainty of the weighing result U ₉₅ (W)	
Partial weighing range 1 0.00000 g...50.00000 g	U ₉₅ (W) = 0.000016 g + 8.61 · 10 ⁻⁴ · R
Partial weighing range 2 60.00000 g...120.0000 g	U ₉₅ (W) = 0.000086 g + 6.19 · 10 ⁻⁴ · R

Reference note: The current uncertainty of measurement is calculated by entering the reading R into the formula. In relation to this, there is no need for a correction of the indication until the reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied with an Expansion factor of 2, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.2. There is a 95 % probability that the value of the measured will be in the assigned value range.

Indication in % from Max1	Net Indication	Uncertainty	Uncertainty relative
	R	U ₉₅ (W)	U ₉₅ (W) _{rel}
1 %	0.60000 g	0.000020 g	0.0003 %
25 %	15.00000 g	0.00012 g	0.0007 %
50 %	30.00000 g	0.00021 g	0.00071 %
75 %	45.00000 g	0.00031 g	0.00070 %
100 %	60.00000 g	0.00041 g	0.00069 %

Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example

Process accuracy	1.00 %
Safety factor	3
Minimum sample weight	0.00474 g

Cert. No. : ACL25352
Job No. : VC68AC0175
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weightings with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL_BP 24-0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL_BP 23-0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62106114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KA1	34560495	AA-3002-25	19-FEB-26

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.

3. This certificate is traceable to the international system of unit maintained at :

- 3.1 National Institute of Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).
- 3.3 Electrical And Electronics Institute (EEI).

Cert. No. : ACL25352
Job No. : VC68AC0175
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long-term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

Cert. No. : ACL25352
Job No. : VC68AC0175
Page : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.4

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A-weight	12.0
C-weight	18.3
Flat	24.0

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.5	0.6	0.6	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	-2.3	-2.2	-2.2	±5.0

Cert. No. : ACL25352
Job No. : VC68AC0175
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	±2.0
125	0.0	0.1	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	±2.0
4000	0.0	0.1	0.0	±3.0
8000	0.1	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.0	0.0	± 0.2
C-weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Imp	94.0	94.0	0.0	± 0.1

6. Long-term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.1	0.1	± 0.3

Cert. No. : ACL25352
Job No. : VC68AC0175
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±1.1
136.0	136.0	0.0	±1.1
135.0	135.0	0.0	±1.1
134.0	134.0	0.0	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.1	0.1	±1.1
114.0	114.0	0.0	±1.1
109.0	109.0	0.0	±1.1
104.0	104.1	0.1	±1.1
99.0	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
30.0	30.0	0.0	±1.1
29.0	29.0	0.0	±1.1
28.0	28.0	0.0	±1.1
27.0	27.0	0.0	±1.1
26.0	26.0	0.0	±1.1
25.0	24.9	-0.1	±1.1

Cert. No. : ACL25352
Job No. : VC68AC0175
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	105.0	105.0	0.0	1.5 : -5.0
	2	8	117.0	117.0	0.0	1.0 : -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	105.0	105.0	0.0	1.0 : -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 : -5.0
	2	8	108.0	108.0	0.0	1.0 : -2.5
	200	800	128.0	128.1	0.1	±1.0

Cert. No. : ACL25352
Job No. : VC68AC0175
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.3	-0.1	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	132.9	-0.1	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.5	0.0	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	137.0	136.9	0.1	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$ or any value following calculation providing a level of confidence of approximately 95 %

End of Calibration Certificate

45/- 40/1 Sirinthorn Road, Bangkumru, Bangkok, 10700 Thailand
Tel : +66 2433 8381 Email : calibration@sithiporn.comCert. No. : ACL25112
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NR-42A / Microphone UC-52 / Preamplifier NH-74
Serial No. : 00623396 / 196643 / 76474
ID No. : RYG TS0621

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PIATTHANAKAN 40, PHATTHANAKAN ROAD,
KHUWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 14 JANUARY 2025
Calibration Date : 27-29 JANUARY 2025
Date of Issue : 30 JANUARY 2025

Calibrated by :

Nathakorn Pinutpaisan

Approved by :

T. Petchum
(Thamakul Petchum)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory.

Cert. No. : ACL25112
Job No. : VC68AC0064
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-1 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL-BP 21/0207	13-FEB-25
Digital Multimeter	33461A	MY33220076	EEL-BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL-BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100113	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KA1	34560495	AA-3001-24	05-FEB-25

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.

3. This certificate is traceable to the international system of unit maintained at :

3.1 National Institute of Metrology (Thailand).

3.2 Thailand Institute of Scientific and Technological Research (TISTR).

*T. Petch*Cert. No. : ACL25112
Job No. : VC68AC0064
Page : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limits (dB)
93.9 (91.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.8

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting (Hz)	Weighting (dB)
A - weight	11.3
C - weight	18.9
Flat	24.4

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	0.6	0.6	0.6	±5.0

*T. Petch*Cert. No. : ACL25112
Job No. : VC68AC0064
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

*T. Petch*Cert. No. : ACL25112
Job No. : VC68AC0064
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.1	0.1	±0.0
125	0.1	0.1	0.1	±1.5
250	0.1	0.1	0.0	±1.5
500	0.0	0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.1	0.1	± 0.3

T. Petch

Cert. No. : ACL25112
Job No. : VC68AC0064
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±1.1
136.0	136.0	0.0	±1.1
135.0	135.0	0.0	±1.1
134.0	134.0	0.0	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.0	0.0	±1.1
114.0	114.0	0.0	±1.1
109.0	109.0	0.0	±1.1
104.0	104.0	0.0	±1.1
99.0	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
30.0	30.1	0.1	±1.1
29.0	29.0	0.0	±1.1
28.0	28.1	0.1	±1.1
27.0	27.1	0.1	±1.1
26.0	26.2	0.2	±1.1
25.0	25.1	0.1	±1.1

Z. Patch.

Cert. No. : ACL25112
Job No. : VC68AC0064
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.1	0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, T _b (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

Z. Patch.

Cert. No. : ACL25112
Job No. : VC68AC0064
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, f _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

11. Overload indication

Measured value (dB)	Deviated Value	Acceptance Limits
Positive one-half cycle	Negative one-half cycle	(dB) (dB)
89.6	89.6	0.0 ±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k=2$
(= 95% value following calculation, providing a level of confidence of approximately 95%)

End of Calibration Certificate

Z. Patch.

CERTIFICATE OF CALIBRATION

Certificate No. : COT-217-67

Page 1 of 2 Pages

MEASUREMENT ITEM
MANUFACTURER
MODEL/TYPE
SERIAL NUMBER
ID NUMBER
CONDITION AS RECEIVED
CUSTOMERHazz Stress Monitor
Delta OHM
H032.2
15006715
RYG, F50220
Used Item
AIS Laboratory group (Thailand) Co., Ltd.
101 Phatthanaburi Rd., Phatthana-Buri, Bangkok 10250 Thailand.RECEIVED DATE : 11 Dec 2024
MEASUREMENT DATE : 20 Dec 2024
ISSUE DATE : 23 Dec 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:
The table on next page give the measured values.REVIEW BY : Spt. S.
APPROVED BY : Spt. S.
NEXT CAL DATE : 20/12/25J
NAC
SITHIPORN ASSOCIATES CO., LTD.

Approval signature:

J. Prapin Jantongkarn
Chief of the Department

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Functions:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 12023313.
Dimension: Diameter 3.3 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.067	20.0	-0.1	0.009
80	25.057	25.0	-0.1	0.009
80	30.050	30.0	-0.1	0.009
80	35.042	35.0	-0.1	0.009
80	40.036	40.0	-0.1	0.009

Table 2: This equipment was connected with Globe thermometer probe Model: TP3270.2, S/N: 20019033.
Dimension: Diameter 3.3 mm, Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.067	20.0	-0.1	0.009
110	25.057	25.0	-0.1	0.009
110	30.050	30.0	-0.1	0.009
110	35.042	35.0	-0.1	0.009
110	40.036	40.0	-0.1	0.009

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 15015509.
Dimension: Diameter 14 mm, Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.067	20.1	0.1	0.009
75	25.057	25.1	0.1	0.009
75	30.050	30.1	0.1	0.009
75	35.042	35.1	0.1	0.009
75	40.036	40.1	0.1	0.009

UUC: User Under Calibration

End of Certificate of Calibration



Pranatee Associates Co., Ltd.
45/14, 15, 16/21, 36
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Bangkok 10600 (Thailand)
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E-mail: jiracalibration@pranatee.com
Web site: www.pranatee.com

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

CERTIFICATE OF CALIBRATION

Certificate No.: CDT-033-68

MEASUREMENT ITEM
MANUFACTURER : Heat Stress Monitor
MODEL/TYPE : HD32.2
SERIAL NUMBER : 15006713
ID NUMBER : RVG, FS0218
CONDITION AS RECEIVED : Used item
CUSTOMER : ALS laboratory group (Thailand) Co., Ltd.
104 Phatthana 40, Phatthana 40 Rd.,
Khwaeng Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE : 17 Jan 2025
MEASUREMENT DATE : 27 Jan 2025
ISSUE DATE : 29 Jan 2025

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follows:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:
The table on next page give the measured values.

Calibration procedure:
The temperature calibration was done by
the traceable calibration against the 1994 CIPM
according to comparison method with standard
digital temperature indicator and standard
temperature probe. The temperature scale was
based on ITS-90.

Traceability:
The measurement results are traceable to the
International System of units (SI) through
national Institute of Metrology (NIMT).
Certificate number: 11-0317-26, Certificate
number: 10-0113-24.

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 AS00, Serial No.: 667637 03,
Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTH-1000 A ME, Serial No.: 871407,
00591 Due date: 21 Oct 2025

Uncertainty of Measurement:
The reported uncertainty of measurement is
based on the standard uncertainty multiplied by a
coverage factor k=2, which for a normal
distribution corresponds to a coverage
probability of approximately 95%. The standard
uncertainty has been determined in accordance
with the GUM Evaluation of measurement data
Guide to the expression of uncertainty in
measurement.

REVIEW BY: *S.T.S.*
APPROVED BY: *[Signature]*
NEXT CAL DATE: 30/01/2026



Calibrated by:
1. Mr. S. S. S. S. S.
2. Mr. S. S. S. S. S.
3. Mr. S. S. S. S. S.

Approved signature: *[Signature]*
Mr. Pranatee Boardman
Calibration Services Manager

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED
IN WRITING FROM THE LABORATORY

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Functions:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 22035270.
Dimension: Diameter 3.3 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.066	20.1	0.0	0.009
80	25.059	25.1	0.0	0.009
80	30.050	30.1	0.1	0.009
80	35.042	35.1	0.1	0.009
80	40.036	40.1	0.1	0.009

Table 2: This equipment was connected with Globe thermometer probe Model: TP3270.2, S/N: 22035462.
Dimension: Diameter 3.3 mm, Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.067	20.1	0.0	0.009
110	25.059	25.2	0.1	0.16
110	30.050	30.0	-0.1	0.009
110	35.042	35.2	0.2	0.009
110	40.036	40.2	0.2	0.009

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 15015409.
Dimension: Diameter 14 mm, Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.067	20.1	0.2	0.009
75	25.059	25.1	0.1	0.009
75	30.050	30.1	0.1	0.009
75	35.042	35.1	0.1	0.009
75	40.036	40.0	-0.0	0.009

UUC: User Under Calibration

Remarks: The reported uncertainty of measurement is 0.16, based on standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

End of Certificate of Calibration



Pranatee Associates Co., Ltd.
45/14, 15, 16/21, 36
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Bangkok 10600 (Thailand)
Tel: +662-04881932
Mobile: +662-04881933
E-mail: jiracalibration@pranatee.com
Web site: www.pranatee.com

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

CERTIFICATE OF CALIBRATION

Certificate No.: CDT-218-67

MEASUREMENT ITEM
MANUFACTURER : Heat Stress Monitor
MODEL/TYPE : HD32.2
SERIAL NUMBER : 15006716
ID NUMBER : RVG, FS0221
CONDITION AS RECEIVED : Used item
CUSTOMER : ALS laboratory group (Thailand) Co., Ltd.
104 Phatthana 40, Phatthana 40 Rd.,
Khwaeng Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE : 11 Dec 2024
MEASUREMENT DATE : 20 Dec 2024
ISSUE DATE : 23 Dec 2024

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follows:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:
The table on next page give the measured values.

Calibration procedure:
The temperature calibration was done by
the traceable calibration against the 1994 CIPM
according to comparison method with standard
digital temperature indicator and standard
temperature probe. The temperature scale was
based on ITS-90.

Traceability:
The measurement results are traceable to the
International System of units (SI) through
national Institute of Metrology (NIMT).
Certificate number: 11-0317-26, Certificate
number: 10-0113-24.

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 AS00, Serial No.: 667637 03,
Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTH-1000 A ME, Serial No.: 871407,
00591 Due date: 21 Oct 2025

Uncertainty of Measurement:
The reported uncertainty of measurement is
based on the standard uncertainty multiplied by a
coverage factor k=2, which for a normal
distribution corresponds to a coverage
probability of approximately 95%. The standard
uncertainty has been determined in accordance
with the GUM Evaluation of measurement data
Guide to the expression of uncertainty in
measurement.

REVIEW BY: *S.T.S.*
APPROVED BY: *[Signature]*
NEXT CAL DATE: 30/12/2025



Calibrated by:
1. Mr. S. S. S. S. S.
2. Mr. S. S. S. S. S.
3. Mr. S. S. S. S. S.

Approved signature: *[Signature]*
Mr. Pranatee Boardman
Calibration Services Manager

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED
IN WRITING FROM THE LABORATORY

Continuation of Certificate of Calibration Number COT-218-67

Page 2 of 2 Pages

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 18005582.
Dimension: Diameter 3.3 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	WBC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.066	20.1	0.0	0.009
80	25.061	25.1	0.0	0.009
80	30.061	30.1	0.0	0.009
80	35.065	35.0	0.0	0.009
80	40.035	40.0	0.0	0.009

Table 2: This equipment was connected with Globe thermometer probe Model: T9376.2, S/N: 15015407.
Dimension: Diameter 3.3 mm, Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	GTC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.066	20.0	-0.1	0.009
110	25.061	25.0	-0.1	0.009
110	30.062	30.0	0.0	0.009
110	35.045	35.0	0.0	0.009
110	40.026	40.0	0.0	0.009

Table 3: This equipment was connected with temperature probe Model: HP3201.2, S/N: 15015402.
Dimension: Diameter 14 mm, Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	WBC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.066	20.3	0.3	0.009
75	25.061	25.7	0.7	0.009
75	30.061	30.3	0.3	0.009
75	35.065	35.0	0.0	0.009
75	40.035	40.0	0.0	0.009

WBC: Wet Bulb Calibration

End of Certificate of Calibration



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NSC-TISI-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

Certificate No.: COT-005-68

MEASUREMENT ITEM: Heat Stress Monitor
MANUFACTURER: Delta OHM
MODEL/TYPE: HD32.2
SERIAL NUMBER: 15006718
ID NUMBER: RYG_150223
CONDITION AS-RECEIVED: Used item
CUSTOMER: AIS Laboratory group (Thailand) Co., Ltd.
104 Phatthanasukan Rd.,
Khwaeng Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE: 27 Dec 2024
MEASUREMENT DATE: 07 Jan 2025
ISSUE DATE: 08 Jan 2025

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:
Temperature: 23.0 ± 3.0 °C
Relative Humidity: 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:
The table on next page give the measured values.

REVIEW BY: *S.S.*
APPROVED BY: *[Signature]*
NEXT CAL DATE: 07/07/25



Approved signature: *[Signature]*
Mr. Parinya Boonchaisri
Facilities Management Manager

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Continuation of Certificate of Calibration Number COT-005-68

Page 2 of 2 Pages

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 18005582.
Dimension: Diameter 3.3 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	WBC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.066	20.1	0.0	0.009
80	25.061	25.1	0.0	0.009
80	30.061	30.1	0.0	0.009
80	35.065	35.0	0.0	0.009
80	40.035	40.0	0.0	0.009

Table 2: This equipment was connected with Globe thermometer probe Model: T9376.2, S/N: 20018538.
Dimension: Diameter 3.3 mm, Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	GTC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.066	20.2	0.1	0.009
110	25.061	25.2	0.1	0.009
110	30.062	30.1	0.0	0.009
110	35.025	35.2	0.2	0.009
110	40.035	40.2	0.2	0.009

Table 3: This equipment was connected with temperature probe Model: HP3201.2, S/N: 15015402.
Dimension: Diameter 14 mm, Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	WBC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.066	20.3	0.3	0.009
75	25.061	25.7	0.7	0.009
75	30.061	30.3	0.3	0.009
75	35.065	35.0	0.0	0.009
75	40.035	40.0	0.0	0.009

WBC: Wet Bulb Calibration

End of Certificate of Calibration



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NSC-TISI-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

Certificate No.: COT-216-67

MEASUREMENT ITEM: Heat Stress Monitor
MANUFACTURER: Delta OHM
MODEL/TYPE: HD32.2
SERIAL NUMBER: 15006711
ID NUMBER: RYG_150217
CONDITION AS-RECEIVED: Used item
CUSTOMER: AIS Laboratory group (Thailand) Co., Ltd.
104 Phatthanasukan Rd.,
Khwaeng Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE: 11 Dec 2024
MEASUREMENT DATE: 20 Dec 2024
ISSUE DATE: 23 Dec 2024

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:
Temperature: 23.0 ± 3.0 °C
Relative Humidity: 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:
The table on next page give the measured values.

REVIEW BY: *S.S.*
APPROVED BY: *[Signature]*
NEXT CAL DATE: 30/12/25



Approved signature: *[Signature]*
Mr. Parinya Boonchaisri
Facilities Management Manager

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Unit(s):

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 14009206.
Dimension: Diameter 3.3 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.052	20.2	0.1	0.099
80	25.061	25.2	0.1	0.099
80	30.039	30.2	0.1	0.099
80	35.045	35.2	0.2	0.099
80	40.019	40.1	0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2, S/N: 17013121.
Dimension: Diameter 3.3 mm, Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.052	20.2	0.1	0.099
110	25.061	25.2	0.1	0.099
110	30.039	30.2	0.1	0.099
110	35.045	35.2	0.2	0.099
110	40.019	40.1	0.2	0.099

Table 3: This equipment was connected with temperature probe Model: TP3201.2, S/N: 17013121.
Dimension: Diameter 3.3 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.052	20.2	0.1	0.099
75	25.061	25.1	0.0	0.099
75	30.039	30.0	0.1	0.099
75	35.045	35.0	0.1	0.099
75	40.019	39.8	0.2	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration



Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 60 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: TH201.3, S/N: 38021466.
Dimension: Diameter 3.3 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.052	20.1	0.0	0.16
80	25.061	25.0	0.0	0.16
80	30.062	30.0	0.0	0.099
80	35.044	35.0	0.0	0.099
80	40.035	40.0	0.0	0.099

Table 2: This equipment was connected with climate thermometer probe Model: TH216.2, S/N: 38020593.
Dimension: Diameter 3.3 mm, Length 265 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.062	20.1	0.0	0.099
110	25.061	25.0	0.0	0.099
110	30.062	30.1	0.0	0.099
110	35.044	35.1	0.1	0.099
110	40.035	40.1	0.1	0.099

Table 3: This equipment was connected with temperature probe Model: TP3202.3, S/N: 18021258.
Dimension: Diameter 16 mm, Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.070	20.2	0.1	0.023
75	25.051	25.1	0.0	0.019
75	30.050	30.1	0.0	0.16
75	35.045	35.0	0.0	0.029
75	40.044	40.0	0.0	0.029

UUC & UUC Reading:

Remark: The reported uncertainty of measurement is 0.16, based on standard uncertainty multiplied by a coverage factor k=2 (100% level of confidence) and approximately 50%.

End of Certificate of Calibration



CERTIFICATE OF CALIBRATION

Certificate No. : CDT-219-67

MEASUREMENT ITEM : Heat Stress Monitor
MANUFACTURER : Delta OHM
MODEL/TYPE : HD32.2
SERIAL NUMBER : 15020724
ID NUMBER : RYG_150228
CONDITION AS-RECEIVED : Used item
CUSTOMER : AIS laboratory group (thailand) Co., Ltd.
304 Phatthanakan Rd., Phatthanakan Rd.,
Khuang Suan Luang, Khut Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE : 11 Dec 2024
MEASUREMENT DATE : 20 Dec 2024
ISSUE DATE : 23 Dec 2024

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:
The table on next page give the measured values.

REVIEW BY: *[Signature]*
APPROVED BY: *[Signature]*
NEXT CAL DATE: 20/12/25



Approved signatory:

[Signature]
Mr. Pannaporn Boonwong
Calibration Department Manager

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: TH201.3, S/N: 38021466.
Dimension: Diameter 3.3 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.060	20.2	0.2	0.099
80	25.061	25.2	0.2	0.099
80	30.063	30.1	0.0	0.099
80	35.045	35.0	0.0	0.099
80	40.036	39.9	-0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TH225.2, S/N: 15021160.
Dimension: Diameter 3.3 mm, Length 265 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.060	20.9	0.2	0.099
110	25.062	24.9	-0.2	0.099
110	30.073	29.9	-0.2	0.099
110	35.045	35.9	0.1	0.099
110	40.036	39.8	-0.2	0.099

Table 3: This equipment was connected with temperature probe Model: TP3201.3, S/N: 35033551.
Dimension: Diameter 16 mm, Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.056	20.3	0.2	0.099
75	25.051	25.2	0.1	0.099
75	30.050	30.1	0.0	0.099
75	35.045	35.0	0.0	0.099
75	40.044	39.9	-0.1	0.099

UUC & UUC Reading:

End of Certificate of Calibration



CERTIFICATE OF CALIBRATION

Certificate No. : CDT-007-68

MEASUREMENT ITEM : Heat Stress Monitor
MANUFACTURER : Delta OHM
MODEL/TYPE : HD32.2
SERIAL NUMBER : 18018312
ID NUMBER : RYG_150357
CONDITION AS-RECEIVED : Used item
CUSTOMER : AIS laboratory group (thailand) Co., Ltd.
304 Phatthanakan Rd., Phatthanakan Rd.,
Khuang Suan Luang, Khut Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE : 27 Dec 2024
MEASUREMENT DATE : 07 Jan 2025
ISSUE DATE : 08 Jan 2025

ENVIRONMENTAL CONDITIONS:
Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:
The table on next page give the measured values.

REVIEW BY: *[Signature]*
APPROVED BY: *[Signature]*
NEXT CAL DATE: 07/12/25



Approved signatory:

[Signature]
Mr. Pannaporn Boonwong
Calibration Department Manager

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Continuation of Certificate of Calibration Number CDT-007-06

Page 2 of 2 Pages

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 18021464.
Dimension: Diameter 3.3 mm, Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.052	20.1	0.0	0.009
80	25.058	25.1	0.0	0.009
80	30.056	30.1	0.0	0.009
80	35.044	35.0	0.0	0.009
80	40.035	40.0	0.0	0.009

Table 2: This equipment was connected with Globe thermometer probe Model: T93276.2, S/N: 18070495.
Dimension: Diameter 3.3 mm, Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.053	20.1	0.0	0.009
110	25.058	25.1	0.0	0.009
110	30.056	30.1	0.0	0.009
110	35.044	35.1	0.1	0.009
110	40.035	40.1	0.1	0.009

Table 3: This equipment was connected with temperature probe Model: T93702.1, S/N: 15081993.
Dimension: Diameter 14 mm, Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.053	20.5	0.5	0.009
75	25.058	25.4	0.4	0.009
75	30.056	30.4	0.4	0.009
75	35.044	35.0	0.6	0.009
75	40.035	40.0	0.0	0.009

UUC: See Model Instruction

End of Certificate of Calibration



Service Confirmation Number: 0905876103

Service Confirmation Date: 23.09.2024

Service Instrument:

Model Number	Model Description	Serial Number	System Handle	Parent Asset
SYS-ID-5100	ICP-DES 5100/5110 System			
GB010A	Agilent 5100 SVDV ICP-DES Spectrometer	MY18010005	ICP DES 5100	SYS-ID-5100
GB410A	SPS 4 Autosampler	AU15440764	ICP DES 5100	SYS-ID-5100

Service Items:

Item	Service/Part #	Description	Qty	Entitlement	Service Start	Service End
1000	EOQ	Enterprise Operational Qualification	1.00	Agreement Entitlement - 100 % covered	22.09.2024	23.09.2024
1010	6010030100	Bottle ICP-DES Wavecal soln 500mL 5 ppm	1.00	Agreement Entitlement - 100 % covered		
1020	5100-7001	Calibration blank solution Spot HN03	1.00	Agreement Entitlement - 100 % covered		

Additional Information:

Customer Contact:

ALS Laboratory Group (Thailand) Co.
Ltd Head Office
101 Phatthanakan 40 Phatthanakan Rd.
Khuang Phatthanakan Kiet Suan
TAX ID : 0105540001059
Chanattagarn Imchom@agilent.com
27603008

Invoice To:

ALS Laboratory Group (Thailand) Co.
Ltd Head Office
101 Phatthanakan 40 Phatthanakan Rd.
Khuang Phatthanakan Kiet Suan

SERVICE REPORT

Customer Purchase Order Number:	Customer Number: 70271013
Service Request:	Service Request Date:
Service Order: R00678001	Service Confirmation: 0905876103

REVIEW BY: Penphen C
APPROVED BY: Signature
NEXT CAL DATE: 25 Nov 2024

Delivery Site:

ALS Laboratory Group (Thailand) Co.
Ltd Head Office

101 Phatthanakan 40 Phatthanakan Rd.
Khuang Phatthanakan Kiet Suan

Location:

Room
Bldg
Lab
Dept

Direct Inquiries to:

Contact Name: Customer Contact Center
Contact E-mail: ccc-smt@agilent.com
Contact Telephone: +662 637 6363
Contact Fax: +662 637 4334

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Fax: +662 637 4338

Page 1 of 1

Service Information:

Problem Description:
WU-QO-ID 5100-5001253655

Service Provided:
Complete OOHV 5100ICPOES
Equipment ID: BKX_EL0037, all test passed

Service Overview Code:
Reason Code: Scheduled Service
Diagnosis Code: Scheduled Service
Resolution Code: Scheduled Service

Reported Hours: 4.0	Travel Hours: 2.0	
Customer Field Service Representative Name: Suwan Onkhom	Customer Field Service Representative Signature: <u>Signature</u>	Date: 23 Sep 2024
Customer Name: CHANATTAGARN IMCHOM	Customer Signature: <u>Signature</u>	Date: 23 Sep 2024

Additional Comments:

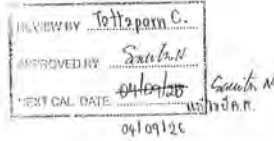


Certificate No. T250355

Page 1 of 6

Certificate of Calibration

Equipment : HEATING BLOCK
Manufacturer : Environmental Express
Model : SC 196
Serial No. : 6974CECW3285
Customer Code : BKK_EL0054
ID No. : TS306A3
Customer : ALS Laboratory Group (Thailand) Co.,Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250
Customer Location : Acid Digestion Lab
Date of Receipt : 26 February 2025
Calibrated By : Atiphong Rongrat (Technician)
Approved By : Boonchai Suriyawong (Site Calibration Manager)
Date of Issue : 27 MAR 2025



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

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

PM-1.12 10/30-05-57

Certificate No. T250355

Page 2 of 6

Calibration Report

Equipment : HEATING BLOCK
Date of Calibration : 4 March 2025
Environment : Temperature : 24.4-24.9 °C
Line Voltage : 221.6-226.3 V
Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

1. This equipment was calibrated by insert nine standard thermocouples type T into its chamber, the other one standard thermocouples type T use for ambient temperature measurement. The calibration was done in according to WI-T20.

All data show below were final values and the initial data from customer request. The temperature scale used was based on ITS - 90.

2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	TYPE T	TN221-TN230	T240712	19 April 2025
TC	TYPE T	TN231-TN240	T240712	19 April 2025
TC	TYPE T	TN241-TN250	T240401	16 March 2025
TC	TYPE T	TN251-TN260	T240401	16 March 2025
DATA LOGGER	34970A	T193	T240401	16 March 2025

3. This certificate is traceable to :

National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244.)

4. Condition of calibrated item : good

Equipment Description :

Time Constant	2	Hour	40	Minute	At	95	°C
Fresh Air Damper	<input type="checkbox"/> Open	<input type="checkbox"/> Min	<input type="checkbox"/> Medium	<input type="checkbox"/> Max			
	<input type="checkbox"/> Close						
	<input checked="" type="checkbox"/> Not Available						

5. Adjustment :

() without adjustment (X) after adjustment

Approved By: Boonchai Suriyawong

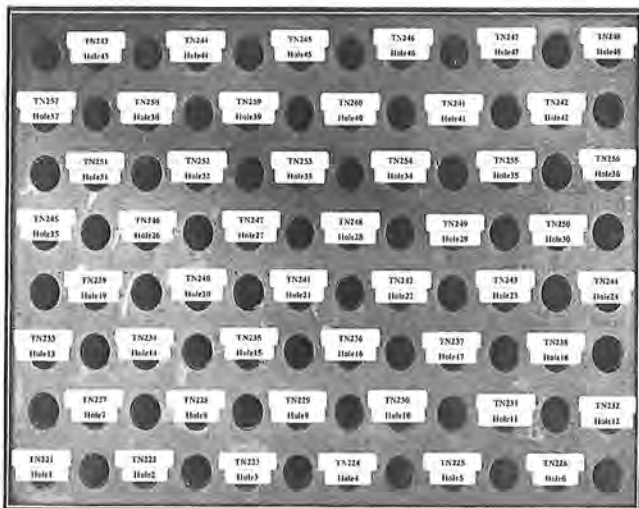
PM-1.13 10/30-05-57



Certificate No. T250355

Page 3 of 6

Calibration Report



FRONT CONTROL

Approved By: Boonchai Suriyawong

PM-1.13 10/30-05-57

Certificate No. T250355

Page 4 of 6

Calibration Report

Measurement Results

Calibration Point	Average Standard Reading at each position (°C)					
R1 Hole1-Hole6	TN221	TN222	TN223	TN224	TN225	TN226
CAL POINT	Max	91.85	95.37	95.03	95.25	94.73
	Min	94.17	94.66	94.38	94.63	94.87
	Average	94.51	95.02	94.70	94.94	94.43
R2 Hole7-Hole12	TN227	TN228	TN229	TN230	TN231	TN232
	Max	94.71	94.36	94.79	95.32	95.64
	Min	94.05	93.88	94.10	94.65	94.90
	Average	94.38	94.22	94.44	94.99	95.17
R3 Hole13-Hole18	TN233	TN234	TN235	TN236	TN237	TN238
	Max	95.26	95.43	95.40	95.71	95.41
	Min	94.54	94.64	94.71	95.10	94.86
	Average	94.90	95.03	95.06	95.41	95.13
R4 Hole19-Hole24	TN239	TN240	TN241	TN242	TN243	TN244
	Max	95.13	95.06	95.68	96.16	95.35
	Min	94.39	94.43	94.86	95.51	94.88
	Average	94.76	94.75	95.27	95.83	95.12
R5 Hole25-Hole30	TN245	TN246	TN247	TN248	TN249	TN250
	Max	94.95	95.81	95.39	95.82	95.66
	Min	94.47	95.03	94.67	94.99	94.84
	Average	94.71	95.42	95.03	95.41	95.25
R6 Hole31-Hole36	TN251	TN252	TN253	TN254	TN255	TN256
	Max	96.07	95.34	96.28	95.39	94.95
	Min	95.28	94.55	95.51	94.62	94.13
	Average	95.67	94.95	95.90	95.00	94.54
R7 Hole37-Hole42	TN257	TN258	TN259	TN260	TN241	TN242
	Max	95.15	95.63	96.11	95.09	95.34
	Min	94.30	94.88	95.32	94.28	94.54
	Average	94.76	95.25	95.71	94.69	94.94
R8 Hole43-Hole48	TN243	TN244	TN245	TN246	TN247	TN248
	Max	95.84	95.87	95.44	95.72	95.65
	Min	95.06	95.10	94.60	94.95	94.87
	Average	95.45	95.48	95.02	95.34	95.26


Approved By: Boonchai Suriyawong

PM-1.13 10/30-05-57

Calibration Report

Measurement Results

Calibration Point	Average Standard Reading at each position (°C)					
R1 Hole1-Hole6	TN221	TN222	TN223	TN224	TN225	TN226
CAL POINT	Max	104.48	104.40	104.60	105.27	105.24
	Min	104.15	104.02	104.25	104.94	104.91
	Average	104.32	104.21	104.42	105.10	105.08
R2 Hole7-Hole12	TN227	TN228	TN229	TN230	TN231	TN232
	Max	105.20	105.45	105.58	105.96	105.81
	Min	104.92	105.14	105.29	105.64	105.53
	Average	105.06	105.29	105.43	105.80	105.67
R3 Hole13-Hole18	TN233	TN234	TN235	TN236	TN237	TN238
	Max	105.09	106.14	105.83	106.25	105.97
	Min	105.80	105.89	105.37	106.09	105.69
	Average	105.94	106.01	105.70	106.13	105.83
R4 Hole19-Hole24	TN239	TN240	TN241	TN242	TN243	TN244
	Max	105.87	105.75	105.30	105.07	105.22
	Min	105.62	105.52	105.13	104.90	105.05
	Average	105.74	105.63	105.21	104.98	105.14
R5 Hole25-Hole30	TN245	TN246	TN247	TN248	TN249	TN250
	Max	105.62	105.34	105.52	105.75	105.97
	Min	105.45	105.35	105.31	105.57	105.81
	Average	105.53	105.44	105.41	105.66	105.89
R6 Hole31-Hole36	TN251	TN252	TN253	TN254	TN255	TN256
	Max	106.19	106.34	106.47	105.96	105.76
	Min	106.02	106.16	106.31	105.77	105.58
	Average	106.10	106.25	106.39	105.87	105.67
R7 Hole37-Hole42	TN257	TN258	TN259	TN260	TN261	TN262
	Max	106.21	105.29	105.45	105.36	106.08
	Min	106.04	105.42	105.28	105.20	105.90
	Average	106.12	105.51	105.37	105.28	106.00
R8 Hole43-Hole48	TN263	TN264	TN265	TN266	TN267	TN268
	Max	106.54	106.33	105.78	105.38	105.42
	Min	106.38	105.16	105.60	105.20	105.25
	Average	106.46	106.25	105.69	105.29	105.33

Approved By: 

FM-L13 09/30-05-27

FM-L13 09/30-05-27

Certificate of Calibration

Equipment : Chamber (Cooling Room)

Manufacturer : KOLDTECH

Model : KM 320

Serial No. : TBN-1012061/05

Customer Code : BKK_EN0167

ID No. : T2463A3

Customer : ALS Laboratory Group (Thailand) Co.,Ltd.


104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan,

Khet Saen Luang, Bangkok 10250

Customer Location : Laboratory Room

Date of Receipt : 28 May 2025

Calibrated By : Aliphong Rongrat (Technician)

Approved By :  / Boonchai Suriyawong (Site Calibration Manager)

Date of Issue : 19 JUN 2025

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

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

Calibration Report

Measurement Results:

HEATING BLOCK			Temperature Distribution	
Setting (°C)	Reading (°C)		Stability (±°C)	Uncertainty (±°C)
	Min, Max	Average		
102.0	-	102.0	0.43	0.83
107.0	-	107.0	0.20	0.70

* The quoted uncertainty exclude "uniformity"

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which for a t-distribution, providing a level of confidence of approximately 95 %.

Approved By: 

Calibration Report

Equipment : Chamber (Cooling Room)

Date of Calibration : 4 June 2025

Environment : Temperature : 23.4-24.9 °C

Line Voltage : 221.4-230.2 V

Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

1. This equipment was calibrated by insert 16 standard thermocouples type T into its chamber, the other one standard thermocouples type T use for ambient temperature measurement. The calibration was done in according to WI-T20 (based on ASTM E145-94 (Reapproved 2001) and AS2853-1986).

All data show below were final values and the initial data from customer request. The temperature scale used was based on ITS - 90.

2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	TYPE T	TN91-TN100	T242036	3 December 2025
TC	TYPE T	TN101-TN110	T242036	3 December 2025
DATA LOGGER	34970A	T121	T242036	3 December 2025

3. This certificate is traceable to :

National Institute of Metrology (Thailand) through Metrological Center (MSC-TISF-TIS 17025 CALIBRATION 0244.)

4. Condition of calibrated item : good

Equipment Description :

Time Constant : 2 Hour, 20 Minute At : 3 °C
 Fresh Air Damper : ☐ Open ☐ Min ☐ Medium ☐ Max
☐ Close
☒ Not Available

5. Adjustment :

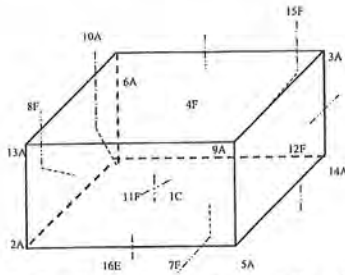
(X) without adjustment () after adjustment

Approved By: 

Certificate No. T250873

Page 3 of 4

Calibration Report



C = Centre, F = Centre of Face, A = Corner, E = Centre of Edge

1C = TN91	12F = TN102
2A = TN92	13A = TN103
3A = TN93	14A = TN104
4F = TN94	15F = TN105
5A = TN95	16E = TN106
6A = TN96	
7F = TN97	
8F = TN98	
9A = TN99	
10A = TN100	
11F = TN101	

Approved By: 

FM-TL07 102/27-03-68

Certificate No. T250873

Page 4 of 4

Calibration Report

Measurement Results

Calibration Point	Average Standard Reading at each position (°C)											
	TN91	TN92	TN93	TN94	TN95	TN96	TN97	TN98	TN99	TN100	TN101	TN102
3.0	2.95	2.92	3.09	2.92	3.16	3.50	3.40	3.03	3.14	2.98	3.44	3.13
	TN103	TN104	TN105	TN106								
	3.19	3.06	3.46	2.92								

Chamber (Cooling Room)			Temperature Distribution				
Setting (°C)	Reading (°C)		Average (°C)	Stability (± °C)	Uniformity (°C)	Uncertainty (± °C)	Coverage Factor k
	Min	Max					
3.0	2.8	3.9	3.4	3.14	1.20	1.30	1.90
							2.04

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which for a t-distribution, providing a level of confidence of approximately 95%.

Approved By: 

FM-TL07 102/27-03-68



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





Certificate of Calibration

Cert.No.: 25CH755
Page.: 1 of 3

Equipment: pH Meter
Manufacturer: Mettler Toledo
Model: SevenGo S2
Serial No.: B712869291
ID No.: RYG_FS0296
Condition As-Received: Used item
Received Date: 24 June 2025
Calibration Date: 25 June 2025
Reference: 2506-0782DSC-1
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. Rayong Branch
616/10 Moo 5, T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand

Ambient Temperature: (25 ± 2.5) °C
Relative Humidity: (50 ± 15) %
Calibration Procedure: In - house method :
- CP-CH5 by direct measurement with DC voltage standard and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with temperature standard

Calibrated by: Warakorn Lemagtrakul

Approved by: 
Approved Signatory

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

Issue Date: 26 June 2025

REVIEW BY: Pithaya T.
APPROVED BY: Sps
NEXT CAL DATE: 25/06/26

The Uncertainties are for a confidence probability of approximately 95%

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



Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	24E2759	25 Aug 2025
2) Ref. Standard Thermometer	4982054	110RC044	24I757	14 July 2025

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

2. Certified Reference Materials

The measurement results are traceable to SI through CPA chem Ltd.

ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.007	CPA chem	1066665	18 Jan 2027
pH 6.905	CPA chem	1066667	18 Jan 2026
pH 10.010	CPA chem	1114385	08 June 2026

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

Calibration Results

Function : mV Measurement

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

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (mV)	Coverage factor k
			mV	pH		
pH Meter	4.00	177.48	178	4.00	0.58	2.00
S/N.: B712869291	7.00	0.00	0	7.00	0.58	2.00
	10.00	-177.48	-178	10.00	0.58	2.00



Cert.No.: 25CH755
Page.: 3 of 3

Calibration Results

Function : pH Measurement

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

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (\pm)	Coverage factor k
pH Electrode S/N.: 2295995	4.007	4.01	152	0.0079	2.00
	6.965	6.97	-21	0.0099	2.00
	10.010	10.01	-190	0.0091	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : InLab®Expert Go-ISM

- Serial No. : 2295995

Dimension of probe

- Length : 120 mm.

- Diameter : 12 mm.

- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (\pm °C)	Coverage factor k
25.0	25.001	25.2	0.199	0.13	2.00
45.0	45.005	45.3	0.295	0.13	2.00

Remark : - UUC* = Unit Under Calibration

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

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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TEL.0-2717-3000-29 FAX 0-2719-9484



Certificate of Calibration

Cert.No.: 25CH847
Page.: 1 of 3

Equipment :

Manufacturer :

Model :

Serial No. :

ID No. :

Condition As-Received:

Received Date :

Calibration Date :

Reference :

Submitted by :

pH Meter

Mettler Toledo

SevenCompact S220

C104059460

RYG_EN0183

Used Item

17 July 2025

18 July 2025

2507-0561DSC-3

ALS Laboratory Group (Thailand) Co.,Ltd.

Rayong Branch

616/10 Moo 5, T.Maenam Khu,

A.Phuakdaeng, Rayong 21140, Thailand

Ambient Temperature :

Relative Humidity :

Calibration Procedure :

(25 \pm 2.5) °C

(50 \pm 15) %

In - house method :

- CP-CH5 by direct measurement with DC voltage

standard and direct measurement with

certified reference material (CRM)

- CP-CH8 by comparison with temperature standard

Calibrated by :

Walalak Sirithean

Approved by :

Saithup

Approved Signatory

() Chakrit Waewwanjua

() Ponpan Paipim

(✓) Saithup Meangmai

Issue Date :

21 July 2025

The Uncertainties are for a confidence probability of approximately 95%

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Cert.No.: 25CH847
Page.: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	24E2759	25 Aug 2025
2) Ref. Standard Thermometer	3240076	60RC033	25I394	01 Apr 2026

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

2. Certified Reference Materials : The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.007	CPA chem	1066665	18 Jan 2027
pH 6.965	CPA chem	1066667	18 Jan 2026
pH 10.010	CPA chem	1114385	08 June 2026

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

Calibration Results

Function : mV Measurement

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

Unit Under Calibration	Nominal Value	Standard Voltage Input		Actual Reading		Uncertainty of Measurement (\pm mV)	Coverage factor k
	pH	mV	mV	pH			
pH Meter S/N.: C104059460	4.000	177.48	177.3	4.000	0.058	2.00	
	7.000	0.00	-0.2	7.000	0.058	2.00	
	10.000	-177.48	-177.6	10.000	0.058	2.00	



Cert.No.: 25CH847
Page.: 3 of 3

Calibration Results

Function : pH Measurement

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

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (\pm)	Coverage factor k
pH Electrode S/N.: 5240606	4.007	4.008	184.6	0.0044	2.00
	6.965	6.966	10.2	0.0084	2.00
	10.010	10.009	-164.9	0.0065	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : InLabExpert Pro-ISM

- Serial No. : 5240606

Dimension of probe

- Length : 120 mm.

- Diameter : 12 mm.

- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (\pm °C)	Coverage factor k
25.0	25.001	25.0	-0.001	0.13	2.00

Remark : - UUC* = Unit Under Calibration

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

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Certificate of Calibration

Certificate No.: 25E2372
Page: 1 of 2

Equipment: pH Meter
Manufacturer: Mettler Toledo
Model: SevenCompact S220
Serial No.: C104059460
ID No.: RYG_EN0183
Condition As-Received: Used Item
Received Date: 17 July 2025
Calibration Date: 22 July 2025
Reference: 2507-0561DSC
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 10) %

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Corporate Services 3: Equipment Calibration and Testing Services.

Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. Rayong Branch

816/10 Moo 5, T.Maenam Khu, A.Pluakdaeng,
Rayong 21140, Thailand

Procedure used: Calibration were conducted using calibration procedure No. CP-E17 according to EURAMET cp-15.

Condition of this result of calibration

1. Reference standards instruments:

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Multi-Product Calibrator	5500A	6315011	25E1627	19 May 2026

- This result of calibration was made on requested at the point specified by customer.
- The certificate is valid only to the item calibrated on date and place of calibration.
- This measurement result is traceable to the International System of Unit maintained through:-
-Technology Promotion Association (Thailand-Japan), NSC-ONSC Accredited No. Calibration 0008

Calibrated by: Napachanok Prasomsosol
Issue Date: 23 July 2025

Approved Signatory:
() Phalinee Prabpapa
() Nuntawat Khumchai
(✓) Pongsaom Boonyaporn



Cert. No.: 25E2372
Page.: 2 of 2

Result of calibration:- (*) Without adjustment () After adjustment

Function: DC voltage measurement	Range: 2000 mV	Standard Value	UUC* Reading	Error	Uncertainty
		(mV)	(mV)	(mV)	(± μV)
		-200.0000	-200.0	0.0	68
		-150.0000	-150.0	0.0	65
		-100.0000	-100.0	0.0	63
		-50.0000	-50.0	0.0	61
		0.0000	0.0	0.0	58
		50.0000	49.9	-0.1	61
		100.0000	99.9	-0.1	63
		150.0000	149.9	-0.1	65
		200.0000	199.9	-0.1	68

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 %

UUC* = Unit Under Calibration.

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Certificate of Calibration

Cert. No.: 25LM10
Page.: 1 of 2

Equipment: DO Meter with Sensor
Manufacturer: YSI
Model: 5000-115V
Serial No.: 15E102796
ID No.: RYG_EN0032

REVIEW BY:
APPROVED BY:
NEXT CAL DATE: 20/07/26

Submitted by: ALS Laboratory Group (Thailand) Co., Ltd.
(Rayong Branch)
816/10 Moo 5 T. Maenam Khu, A. Pluakdaeng,
Rayong 21140 Thailand
Location: TPA On Site Calibration Laboratory

Received Order: 17 January 2025
Calibrated Date: 20 January 2025
Ambient Temperature: (26 ± 10) °C
Relative Humidity: (50 ± 30) %
AC Line Voltage: (220 ± 22) V

Calibrated by: Warakorn Lernagatrakul

Approved by:

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

Issue Date: 23 January 2025

The Uncertainties are for a confidence probability of approximately 95%

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



Equipment: DO Meter with Sensor
Condition As-Received: Used Item
Reference: 2501-0600DSC-2

Cert. No.: 25LM10
Page.: 2 of 2

Procedure Used :-

Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer (IPRT) into Temperature Bath.

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Digital Thermometer	2188080	2411022	TPA	17 Sep 2025

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

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

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

Result of Calibration :- (*) Without Adjustment

Function : Temperature measurement.

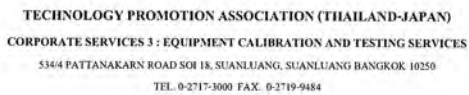
This instrument was connected with temperature sensor, S/N.: 15E100464

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
20.00	60	20.002	19.81	-0.192	0.15	2.00

UUC* : Unit Under Calibration

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

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Cert.No.: 25TW15
Page.: 1 of 2

Cert.No.: 25TW15
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

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

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

2. Standard Material :-

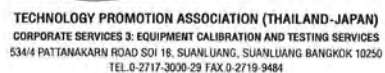
<u>Material</u>	<u>Manufacturer</u>	<u>Lot.No.</u>	<u>Assay</u>
Sodium Thiosulfate 5-Hydrate AR	KEMAUS	2203162447	99.6%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 15E100464

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

This report was certified only for the instrument we tested. It is allowable to use for study
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other in full, without written approval of the laboratory

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Cert. No.: 24TM1663
Page : 1 of 3

REVIEW BY *Thanitak.*
APPROVED BY *D. Jones*
NEXT CAL DATE **01/05/26**

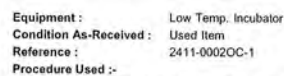
Calibrated by : Krisda Malee
Approved by : Kunchit
Approved Signatory

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

Issue Date : 07 November 2024

The Uncertainties are for a confidence probability of approximately 95%

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Cert. No.: 24TM1663
Page : 2 of 3

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

Condition of this result of calibration

1. Reference standard instrument:-

<u>Instrument</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Traceable</u>	<u>Due Date</u>
1) Data Acquisition	MY44073381	24LM73	TPA	18 May 2025

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

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

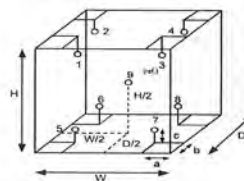
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close

Environment during calibration		
	Beginning	Finished
Temp. (°C)	24	25
REL.Humid. (%)	55	53
AC Supply (Volt)	220	221



Probe Installation Details :

Probe Installation Data

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

Dimension of Chamber :

Dimension of Chamber		
D =	0.60	m
W =	1.0	m
H =	1.2	m
Capacity =	0.72	m ³

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



Equipment : Low Temp. Incubator
Condition As-Received : Used Item
Reference : 2411-0002OC-1
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Cert. No.: 24TM1663
Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor k
20.0	20.0	20.0	0.026	0.26	0.53	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (±°C)
	1	2	3	4	5	6	7	8	9 (ref.)	
20.0	20.071	19.915	20.273	20.179	19.977	19.782	20.056	20.026	20.033	0.30

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

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

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

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

UUC* : Unit Under Calibration

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

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

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Certificate of Calibration

Cert.No.: 25CG3668
Page: 1 of 2

Equipment : Burette
Capacity : 50 mL
Serial No. :
ID. No. : RYG_EN0216
Manufacturer : Wieg
Made in : Germany
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.
Rayong Branch
616/10 Moo 5 T.MaenamKoo, A.Pluakdaeng
Rayong 21140, Thailand
Ambient Temperature : (20 ± 2.5) °C
Relative Humidity : (50 ± 10) %
Barometric Pressure : 753 mmHg
Calibration Procedure : ASTM E 542 - 01
Calibrated by : Srisuda Khamtha
Approved by :
() Ponpan Palpin
(✓) Chakrit Wawwanjua
Issue Date : 19 September 2025

REVIEW BY *Thanitak*
APPROVED BY *D. Khamtha*
NEXT CAL DATE : 18/09/26

The Uncertainties are for a confidence probability of approximately 95%

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Equipment : Burette
Received Date : 16 September 2025
Condition As-Received : Used Item
Calibration Date : 18 September 2025
Reference : 2508-0564DSC-3

Cert.No.: 25CG3668
Page: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

Instruments	Model	Serial No.	ID. No.	Certificate No.	Traceability	Due date
1) Balance	XP205	B134206712	140RC007	25MM296	TPA	16 July 2026
2) Humidity/Baro/Temp	MHB-382SD	AM.42259	140EC016	25H1616	TPA	14 Aug 2026
3) Digital Thermometer	HH376	230806555	140EC013	25H1740	TPA	17 Jan 2026

This measurement result is traceable to SI Unit

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

3. True value is converted to true volume at the standard temperature of 20 °C

Calibration result:

Nominal capacity (mL)	Reading (mL)	Uncertainty (± mL)	k Factor
10	10.0264	0.0082	2.00
25	25.0141	0.0087	2.00
50	49.9952	0.010	2.00

Remark mL = cm³

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

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Certificate of Calibration

Equipment: SPECTROPHOTOMETER
Model: DR6000
Serial No. (or ID.): 1627845 (RYG_EN0037)
Manufacturer: HACH
Condition: In Condition
Certificate No.: C06250108
Issued Date: 18 March 2025
Job No.: WD-00064379
Page: 1 of 3

Customer: ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch) Phetcharas
616/10 Moo 5 T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand.
APPROVED BY *D. Khamtha*
NEXT CAL DATE : 18/09/26

Environment Condition: Temperature 24.4 °C ± 0.3 °C
Humidity 60.8 %RH ± 3.5 %RH

Calibration Place: ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
(Wei Chemistry Lab)
616/10 Moo 5 T.Maenam Khu, A.Pluakdaeng, Rayong 21140, Thailand.

Calibration By: Mr.Preecha Phoosai
Calibration Date: 18 March 2025
The Method used: In house method. CAL-WI-24, base on ASTM E 275-08 and ASTM E 387-04
Traceability: This certificate is traceable to the CRM maintained by National Institute of Standards and Technology (NIST) through Starna Scientific Limited.

The standard for Wavelength Certificate No. 111583 and 111584
The standard for Photometric Certificate No. 9114984 and 111588
The standard for Stray light Certificate No. 111586 and 111585
The standard for Spectral resolution Certificate No. 111587

(Mr. Preecha Phoosai)
Person in charge

(Miss Kaewkan Suradech)
Authorized signatory

This certificate is issued in 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 calculated 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.
Main Resource Unit Ltd 6/F
DKSH Technology Limited
2533 Sukhumvit Road, Bangkok, Thailand 10260
Phone: +66 2679 7000 Email: info@dkshgroup.com Website: www.dkshgroup.com

Delivering Growth - in Asia and Beyond.

CAL-FM-C06-16: 11 Mar 2024

Calibration Results:
Without Adjustment

Wavelength Accuracy (nm), The spectral bandwidth of Std at 2 nm and UUC at 2 nm

Standard Wavelength	Unit Under Calibration	Correction	Uncertainty
418.61	418.5	0.11	0.13
538.66	538.7	-0.04	0.13
637.98	638.3	-0.32	0.13
748.48	748.8	-0.32	0.13
807.03	807.5	-0.47	0.13

Photometric Accuracy (Absorbance)

Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
420 nm	0.0000	0.000	0.0000	0.0045
	0.2930	0.291	0.0020	0.0045
	0.5168	0.518	-0.0012	0.0045
	1.0298	1.031	-0.0012	0.0045
440 nm	0.0000	0.000	0.0000	0.0045
	0.2867	0.285	0.0017	0.0045
	0.5073	0.506	-0.0007	0.0045
	1.0083	1.009	-0.0007	0.0045
485 nm	0.0000	0.000	0.0000	0.0045
	0.2516	0.250	0.0016	0.0045
	0.4595	0.461	-0.0015	0.0045
	0.9334	0.935	-0.0016	0.0045
546.1 nm	0.0000	0.000	0.0000	0.0045
	0.2461	0.246	0.0001	0.0045
	0.4652	0.466	-0.0008	0.0045
	0.9468	0.948	-0.0012	0.0045
590 nm	0.0000	0.000	0.0000	0.0045
	0.2594	0.259	0.0004	0.0045
	0.5040	0.505	-0.0010	0.0045
	1.0032	1.004	-0.0008	0.0045
635 nm	0.0000	0.000	0.0000	0.0045
	0.2579	0.258	-0.0001	0.0045
	0.4971	0.497	0.0001	0.0045
	0.9720	0.973	-0.0010	0.0045

บริษัท ดีเคเอส อีเซีย จำกัด
DKSH Technology Limited
2533 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
2533 Sukhumvit Road, Bangkok, Thailand 10110
Phone: +66 2025 7000 Email: info@dksh.co.th Website: www.dksh.co.th

Delivering Growth - in Asia and Beyond.

CAL-FA-C06-16: 11 Mar 2024

Calibration Results:
Without Adjustment

Photometric Accuracy (Absorbance)

Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
235 nm	0.0000	0.000	0.0000	0.0080
	0.7355	0.738	-0.0025	0.0080
257 nm	0.0000	0.000	0.0000	0.0080
	0.8574	0.857	0.0004	0.0080
313 nm	0.0000	0.000	0.0000	0.0080
	0.2864	0.290	-0.0036	0.0080
350 nm	0.0000	0.000	0.0000	0.0080
	0.8374	0.837	0.0004	0.0080

Stray light *

Standard: cut-off	UUC: Wavelength (nm)	UUC: Transmission (1/T)	Absorbance (A)
260.62 +/- 0.11 nm	260.6	1.7	1.770
391.44 +/- 0.11 nm	391.4	1.4	1.854

Spectral Resolution *

Nominal Concentration 0.02 % v/v	Peak	Trough	Ratio	SBW
Standard Wavelength (nm)	268.66	266.69	1.38	2.00
UUC: Wavelength (nm)	268.2	266.2		
Std Absorbance (A)	0.4586	0.2780		
UUC: Absorbance (A)	0.413	0.299		

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

The End of Certificate

บริษัท ดีเคเอส อีเซีย จำกัด
DKSH Technology Limited
2533 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
2533 Sukhumvit Road, Bangkok, Thailand 10110
Phone: +66 2025 7000 Email: info@dksh.co.th Website: www.dksh.co.th

Delivering Growth - in Asia and Beyond.

CAL-FA-C06-16: 11 Mar 2024

ใบตรวจสอบสภาพเครื่องวัดสิ่งแวดล้อม

เลขที่ใบงาน: WO-00064379

ชนิดเครื่องวัด: SPECTROPHOTOMETER

รุ่น: DR6000

หมายเลขเครื่อง: 1627845

ตรวจสอบ (วัน)		รายการตรวจเช็ค	ตรวจสอบชื่อ (ชื่อ)		หมายเหตุ
18 Mar 2025			18 Mar 2025		
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. แรงดันไฟฟ้า (Battery Backup) >= 2.5 VDC	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	7. ตัวหมุนเลือกความยาวคลื่น (Wavelength Control)	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. ความยาวคลื่น (Wavelength Check)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	9. แหล่งกำเนิดแสง (UV < 3,000 hour)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.5 Hours
<input checked="" type="checkbox"/>	<input type="checkbox"/>	10. แสงที่มองเห็น (Visible < 5,000 hour)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	893.0 Hours
<input checked="" type="checkbox"/>	<input type="checkbox"/>	11. ชุดตัวอย่างตัวหมุน (Carousel Module)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		pH Meter and Conductivity Meter			
<input type="checkbox"/>	<input type="checkbox"/>	12. อิเล็กโทรด (Electrode and Connection Cable)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	13. ระดับสารละลายใน Electrode (Level KCl)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	14. ฝาปิดกันลม Electrode (Dust Protection Hood)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	15. รางยึดอิเล็กโทรด (Stand)	<input type="checkbox"/>	<input type="checkbox"/>	
		Turbidimeter			
<input type="checkbox"/>	<input type="checkbox"/>	16. ค่าความขุ่นตัวอย่าง (No Sample)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	17. ขั้วการส่งแสงของแสง (>= 2.5 ไมล์ 3.0)	<input type="checkbox"/>	<input type="checkbox"/>	
		Automatic titrator			
<input type="checkbox"/>	<input type="checkbox"/>	18. เข็ม 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"/>	

เงื่อนไขการสอบเทียบ: * 658.1nm = 656.1nm

* 486.0nm = 485.7nm

Mr.Preecha Phooansai
Service Engineer

บริษัท ดีเคเอส อีเซีย จำกัด
DKSH Technology Limited
2533 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
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Delivering Growth - in Asia and Beyond.

CAL-FA-R21-03: 20 Jul 2022



Accredited by

NSC-TISI-TIS 17025

Calibration 0426

Calibration certificate

Calibration Certificate No. 25BK1.0002

Object	Electronic non-automatic weighing instrument	This calibration certificate documents the traceability to national standards.
Manufacturer	Sartorius	Uncertainties of measurements are taken into account when only statements of compliance are made.
Type	MCE224S-ZS00-U	This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP WI 05.
Serial / QM Ident. no.	38101399 / RYG_EN0163	This certificate relate and apply this equipment only.
Customer	ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)	
Order no.	2230	
Number of pages	4	
Date of calibration	20 Feb 2025	

REVIEW BY: Thanitak

APPROVED BY: D. Chonchai

NEXT CAL DATE: 20/02/26

This calibration certificate may not be reproduced other than in full except with the permission of NSC-TISI-TIS-17025 and the issuing laboratory. Calibration certificates without signature are not valid.

The user is obliged to have the object recalibrated at appropriate intervals.

Date	08 Mar 2025	Approval of the Calibration Certificate	Person in charge
		<u>Mr. Chonchai Inthana</u>	<u>Kachen Lalee</u>

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang
10310 BangkokVerica®
Version 6.5

Page 1 | 4

Calibration object

Single range instrument

Model	MCE224S-2500-U
Serial Number	38101399
QM Ident. no Inventory no.	RYG_EN0163 --

Maximum capacity (Max. load)	220.0000 g
Measured range	220.0000 g
Scale interval	0.0001 g

Place of calibration

Address	According to page 7
Department Cost center	Laboratory Department. --
Building Floor	-- 1st Floor.
Room	Balance Room.
Maximum temperature variation at place of calibration	5 K

Calibration procedure

EURAMET cg-18, V4.0 - Guidelines on the Calibration of Non-Automatic Weighing Instruments

Test equipment

Test equipment type	Test equipment ID	Valid until
Thermometer	MHB-382SD s/nB011342 Traceable to SI unit through DKSH	21 Aug 2025
Test weight set OIML R111 E2	Certificate No.M23081975_E2(Traceable to SI unit through TCS)	23 Aug 2025

Adjustment Status

The measuring device was internally adjusted before the calibration.

Environmental and measuring conditions

Date of calibration	20 Feb 2025
Temperature at place of calibration Temp. diff.	24.4 °C 0.6 K
Weights - T place	The installation site is suitable. The device was levelled. Balance was loaded up to Max before test.
Measuring conditions	
Comments	Humidity 59.0 %RH.

Measurement results | Measurement uncertainties

Repeatability	Eccentricity
Test load (nominal): 10 g 200 g	Test load (nominal): 100 g
10 g	Center
1 10.0000 g	100.0000 g
2 10.0000 g	100.0000 g
3 10.0000 g	100.0000 g
4 9.9999 g	100.0000 g
5 9.9999 g	100.0000 g
6 10.0000 g	100.0000 g
7 10.0000 g	100.0000 g
8 10.0000 g	100.0000 g
9 9.9999 g	100.0000 g
10 10.0000 g	99.9999 g
s = 0.00005 g	s = 0.00005 g

Testload	Indication	Error	Expansion factor	Uncertainty	Uncertainty relative
L	I	E	k	U(E)	U(E)/I
0.0100 g	0.0100 g	0.0000 g	2.00	0.00013 g	1.3 %
0.1000 g	0.1000 g	0.0000 g	2.00	0.00013 g	0.13 %
0.5000 g	0.5000 g	0.0000 g	2.00	0.00013 g	0.026 %
1.0000 g	1.0000 g	0.0000 g	2.00	0.00013 g	0.013 %
5.0000 g	5.0000 g	0.0000 g	2.00	0.00013 g	0.0026 %
10.0000 g	9.9999 g	-0.0001 g	2.00	0.00013 g	0.0013 %
20.0000 g	20.0000 g	0.0000 g	2.00	0.00014 g	0.00068 %
50.0000 g	50.0001 g	0.0001 g	2.00	0.00015 g	0.00029 %
100.0000 g	100.0000 g	0.0000 g	2.00	0.00019 g	0.00018 %
200.0000 g	200.0000 g	0.0000 g	2.00	0.00028 g	0.00014 %
220.0000 g	220.0000 g	0.0000 g	2.00	0.00032 g	0.00015 %

Maximum error of indication

|E|_{max} = 0.0001 g

U(E) is the quotient of U(I) and test load I. The uncertainty of measurement U(E) is valid only if error E is considered. You will find reference notes on the uncertainty of measurement in use under: Appendix to the calibration certificate | Interpretation of measurement results.

Reference note: The reported expanded uncertainty of measurement is stated at the standard uncertainty of measurement multiplied with an expansion factor of 2, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measured will lie in the assigned value range.

End of calibration certificate

Interpretation of measurement results | Appendix to the calibration certificate

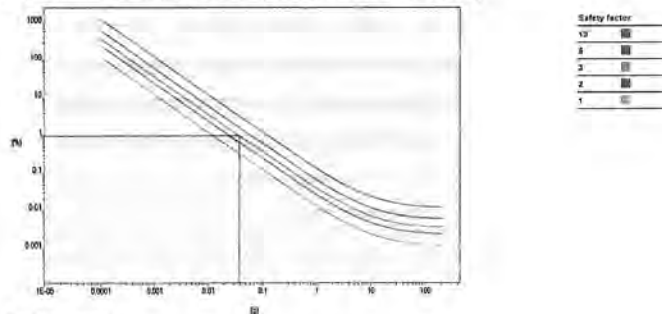
Uncertainty of measurement in use

Device adjusted before measurement	Yes
Temperature deviation considered	1.5 K (isoCAL active)
Temperature coefficient considered	1 · 10 ⁻³ /K
Uncertainty of the weighing result U ₉₅ (W)	U ₉₅ (W) = 0.00013 g + 1.16 · 10 ⁻³ · R

Reference note: The current uncertainty of measurement is calculated by entering of the reading R into this formula. In relation to this, there is no need for a correction of the indication error. The reported expanded uncertainty of measurement is stated at the standard uncertainty of measurement multiplied with an expansion factor of 2, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measured will lie in the assigned value range.

Indication in % from max load	Net indication R	Uncertainty U ₉₅ (W)	Uncertainty relative U ₉₅ (W)/R
1 %	2.2000 g	0.00016 g	0.0071 %
25 %	55.0000 g	0.00077 g	0.0014 %
50 %	110.0000 g	0.0014 g	0.0013 %
75 %	165.0000 g	0.0020 g	0.0012 %
100 %	220.0000 g	0.0027 g	0.0012 %

Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example

Process accuracy	1.00 %
Safety factor	3
Minimum sample weight	0.0381 g



Metrology Center

SCI ECO Services Company Limited

51 Moo 8, Tubkhwang, Kaeng Khoi, Saraburi, Thailand 18260

Bangkok Tel : +668 9205 6851 , +669 81924 0059

Saraburi Tel : +669 8247 2360

Website : www.scieco.co.th E-Mail : calibrate@scg.co.th



Certificate No. T251530

Certificate of Calibration

Page 1 of 3

Equipment : Chamber (Oven)

Manufacturer : MEMMERT

Model : UF 110

Serial No. : B416.2420

Customer Code : RYG_EN0012

ID No. : T6444A5

Customer : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)

616/10 Moo 5 T.Maenamkoo,

A.Pluakdaeng, Rayong 21140

Customer Location : ENVIRONMENT LABORATORY

Date of Receipt : 3 September 2025

Calibrated By : Sujjar Nakhakred (Site Calibration Manager)

Approved By : Boonchai Suriyawong (Site Calibration Manager)

Date of Issue : 17 SEP 2025

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

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



Certificate No. T251530

Page 2 of 3

Calibration Report

Equipment : Chamber (Oven)
Date of Calibration : 10 September 2025
Environment : Temperature : 35.7-36.6 °C
Line Voltage : 226.8-233.7 V
Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

1. This equipment was calibrated by insert nine resistance thermometer detectors into its chamber , the other one resistance thermometer detector use for ambient temperature measurement . The calibration was done in according to WI-T20 (based on ASTM E145-94 (Reapproved 2019) and AS2853-1986) .
All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .

2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
RTD	100 ohm	30-(CH1)-10	T242203	9 November 2025
DATA LOGGER	34970A	T47	T242203	9 November 2025

3. This certificate is traceable to :

National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244)

4. Condition of calibrated item : good

Equipment Description :

Time Constant : 3 Hour 29 Minute At 104 °C
Fresh Air Damper : ☒ Open ☒ Min ☐ Medium ☐ Max
☐ Close
☐ Not Available

5. Adjustment :

() without adjustment

(X) after adjustment

Approved By: Don Zai

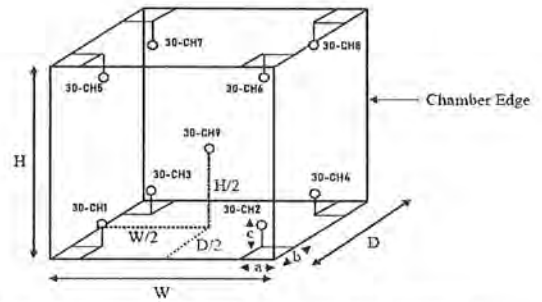
FM-TL07 102/27-03-65



Certificate No. T251530

Page 3 of 3

Calibration Report



Remark : Internal Dimensions of Chamber : W (Width) = 56 cm , H (Height) = 48 cm and D (Depth) = 40 cm .
Size of installed Standard sensor number 30-CH1 to number 30-CH8 : a = 5 cm , b = 5 cm , and c = 5 cm .
Size of installed Standard sensor number 30-CH9 : W/2 = 56 cm / 2 , H/2 = 48 cm / 2 , and D/2 = 40 cm / 2

Measurement Results

Average Standard Reading at each position (°C)									
Calibration Point	30-CH1	30-CH2	30-CH3	30-CH4	30-CH5	30-CH6	30-CH7	30-CH8	30-CH9
104	104.02	103.70	104.01	104.16	104.11	104.08	104.01	104.33	103.61
180	180.67	178.78	182.38	179.85	179.16	180.27	180.98	181.04	178.49

Chamber (Oven)			Temperature Distribution				
Setting °C	Reading (°C)		Average (°C)	Stability (±°C)	Uniformity (°C)	Uncertainty (± °C)	Coverage Factor k
	Min, Max	Average					
104.0	103.9, 104.1	104.0	104.00	0.08	0.61	0.42	2.00
180.0	179.9, 180.1	180.0	180.07	0.21	1.51	0.52	2.00

* The quoted uncertainty exclude uniformity

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on data and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which has a distribution, providing a level of confidence of approximately 95%.

End of Certificate.

Approved By: Don Zai

FM-TL07 102/27-03-65



Certificate No. T242075

Page 1 of 3

Certificate of Calibration

Equipment : Liquid Bath (Water)
Manufacturer : Memmert
Model : WNE29
Serial No. : L623.0105
Customer Code : RYG_EN0220
ID No. : T5650A5
Customer : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu,
A.Pluaekdaeng, Rayong 21140
Customer Location : Wet Chemistry Lab
Date of Receipt : 11 December 2024
Calibrated By : Atiphong Rongrat (Technician)
Approved By : Boonchai Suriyawong (Site Calibration Manager)
Date of Issue : 7 Dec 2024

REVIEW BY: Thanitak
APPROVED BY: D. Surin
NEXT CAL DATE: 19/12/25

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

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

FM-TL14119/08-06-66



Certificate No. T242075

Page 2 of 3

Calibration Report

Equipment : Liquid Bath (Water)
Date of Calibration : 19 December 2024
Environment : Temperature : 25.3-25.9 °C
Line Voltage : 221.4-225.4 V
Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

1. This equipment was calibrated by insert five resistance thermometer detectors into its water bath , the other one thermocouple type T use for ambient temperature measurement . The calibration was done in according to WI-T36 (based on ASTM E715-60 (Reapproved 2001)) .
All data show below were final values and the initial data from customer request . The temperature scale used , was based on ITS - 90 .

2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
RTD	100 OHM	M34 (CH1-CH5)	T248400	18 March 2025
DATA LOGGER	34970A	T193	T248400	18 March 2025

3. This certificate is traceable to :

National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244)

4. Condition of calibrated item : good

Equipment Description :

Time Constant : 1 Hour 30 Minute At 63 °C

5. Adjustment :

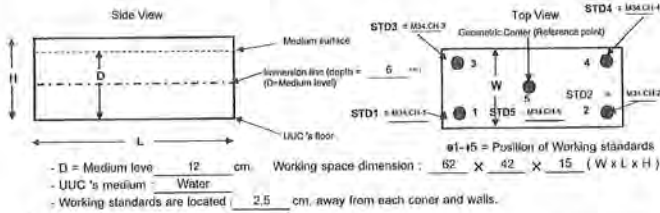
(X) without adjustment

() after adjustment

Approved By: Boonchai Suriyawong

FM-TL14119/08-06-66

Calibration Report



Measurement Results:

Calibration Point	Average Standard Reading at each position (°C)				
	M34.CH-1	M34.CH-2	M34.CH-3	M34.CH-4	M34.CH-5
63	62.87	63.00	62.88	62.98	63.22
85	84.76	85.14	84.88	85.07	85.24

Liquid Bath (Water)			Temperature Distribution				
Setting (°C)	Reading (°C)		Average (°C)	Stability (± °C)	Uniformity (± °C)	Uncertainty (± °C)	Coverage Factor k
	Min	Max					
63.0	-	63.0	62.99	0.07	0.25	0.23	2.09
85.0	-	85.0	85.02	0.13	0.35	0.26	2.09

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which for a t-distribution, providing a level of confidence of approximately 95 %.

Approved By:

FM-L15 118/08-08-66

FM-TL06 102/27-03-66

Calibration Report

Equipment : Liquid Bath (Water)
Date of Calibration : 27 November 2025
Environment : Temperature : 25.5-25.7 °C
Line Voltage : 221.8-225.5 V
Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

- This equipment was calibrated by insert five resistance thermometer detectors into its water bath, the other one thermocouple type T use for ambient temperature measurement. The calibration was done in according to WI-T36 (based on ASTM E715-80 (Reapproved 2022)). All data show below were final values and the initial data from customer request. The temperature scale used was based on ITS - 90.
- Reference Standard Instrument :

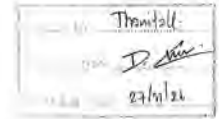
Instrument	Model	Instrument No.	Certificate No.	Due Date
RTD	100 OHM	M18 (CH1-CH5)	T251758	17 October 2026
DATA LOGGER	34970A	T261	T251758	17 October 2026
- This certificate is traceable to :
National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244.)
- Condition of calibrated item : good
Equipment Description :
Time Constant : 1 Hour 3 Minute At 63 °C
- Adjustment :
(X) without adjustment () after adjustment

Approved By:

FM-TL09 102/27-03-66

Certificate of Calibration

Equipment : Liquid Bath (Water)
Manufacturer : Memmert
Model : WNE29
Serial No. : L623.0105
Customer Code : RYG_EN0220
ID No. : TS650A5
Customer : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenamkoo,
A.Pluakdaeng, Rayong 21140

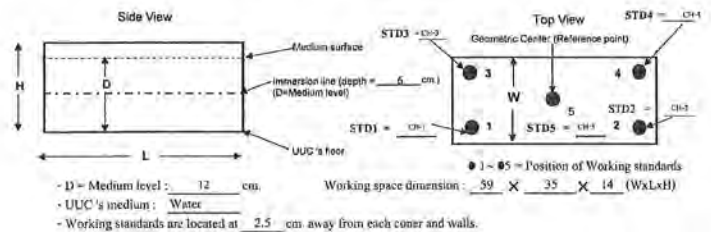


Customer Location : Wet Chemistry Lab
Date of Receipt : 19 November 2025
Calibrated By : Sujjar Nakkakred (Site Calibration Manager)
Approved By : / Boonchai Suriyawong (Site Calibration Manager)
Date of Issue : 01 DEC 2025

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

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

Calibration Report



Measurement Results:

Calibration Point	Average Standard Reading at each position (°C)				
	CH-1	CH-2	CH-3	CH-4	CH-5
63	62.93	63.13	62.94	63.10	63.09
85	85.15	85.33	85.21	85.43	85.20

Liquid Bath (Water)			Temperature Distribution				
Setting (°C)	Reading (°C)		Average (°C)	Stability (± °C)	Uniformity (± °C)	Uncertainty (± °C)	Coverage Factor k
	Min	Max					
63.0	62.9	63.1	63.0	0.06	0.17	0.27	2.06
85.0	84.8	85.2	85.0	0.13	0.24	0.43	2.23

* The quoted uncertainty exclude "uniformity"

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which for a t-distribution, providing a level of confidence of approximately 95 %.

End of Certificate.

Approved By:

FM-TL07 102/27-03-66

Calibration Results:

Before Adjustment

Standard	Unit Under Calibration	Correction	Coverage Factor	Uncertainty (±)
Conductivity Solution	Reading		(k)	
25.000 $\mu\text{S/cm}$	27.43 $\mu\text{S/cm}$	-2.430 $\mu\text{S/cm}$	2.00	0.28 $\mu\text{S/cm}$
84.003 $\mu\text{S/cm}$	80.76 $\mu\text{S/cm}$	+3.243 $\mu\text{S/cm}$	2.00	0.68 $\mu\text{S/cm}$
1413.1 $\mu\text{S/cm}$	1464 $\mu\text{S/cm}$	-50.9 $\mu\text{S/cm}$	2.00	11 $\mu\text{S/cm}$
12.881 mS/cm	13.41 mS/cm	-0.529 mS/cm	2.00	0.098 mS/cm

After Adjustment : at 25 $\mu\text{S/cm}$, 84 $\mu\text{S/cm}$, 1413 $\mu\text{S/cm}$, 12.88 mS/cm

Standard	Unit Under Calibration	Correction	Coverage Factor	Uncertainty (±)
Conductivity Solution	Reading		(k)	
25.000 $\mu\text{S/cm}$	25.63 $\mu\text{S/cm}$	-0.630 $\mu\text{S/cm}$	2.00	0.28 $\mu\text{S/cm}$
84.003 $\mu\text{S/cm}$	84.53 $\mu\text{S/cm}$	-0.527 $\mu\text{S/cm}$	2.00	0.68 $\mu\text{S/cm}$
1413.1 $\mu\text{S/cm}$	1415 $\mu\text{S/cm}$	-1.9 $\mu\text{S/cm}$	2.00	11 $\mu\text{S/cm}$
12.881 mS/cm	12.92 mS/cm	-0.039 mS/cm	2.00	0.098 mS/cm

The End of Certificate

Unit Addressed: 25001501
DKSH Technology Limited
2500 Sukhumvit Road, Bangkok, Thailand 10110
Phone: +66 2039 7100 Email: info@dksh.com

Delivering Growth - in Asia and Beyond

CAL-FM-C24-09: 12 Sep 2022

เลขที่ใบงาน: WO-00064803

ชนิดเครื่องมือ: CONDUCTIVITY METER

รุ่น: Orion STAR A215

หมายเลขเครื่อง: X58821

ตรวจสอบ (ปี)	ผลการตรวจเช็ค	ตรวจพบ (ข้อ)	หมายเหตุ
21 Mar 2025		21 Mar 2025	
ปกติ	ไม่ปกติ	ปกติ	ไม่ปกติ
General			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. ความแม่นยำเครื่อง	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. ความสะอาด (ของใช้ล้าง, ภายใน-นอกเครื่อง)	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. สวิตช์ เปิด - ปิด (On-Off Switch)	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. ปุ่มกด (Keypad)	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. หน้าจอ (Display, Screen Contrast)	<input checked="" 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"/>	7. ควบคุมเลือกความยาวคลื่น (Wavelength Control)	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	8. ความยาวคลื่น (Wavelength Check)	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	9. แหล่งกำเนิดแสง (LUV $< 3,000$ hour)	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	10. แสงที่ผ่านแสง (Visible $< 5,000$ hour)	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	11. เซนเซอร์ความยาวคลื่น (Caroussel Module)	<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"/>	13. ระดับสารละลายใน Electrode (Level KCl)	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	14. ฝาปิดป้องกัน Electrode (Dust Protection Hood)	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	15. ขาตั้งอิเล็กโทรด (Stand)	<input checked="" type="checkbox"/>
Turbidimeter			
<input type="checkbox"/>	<input type="checkbox"/>	16. ค่าความขุ่นที่ต่ำสุด (No Sample)	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	17. เซนเซอร์แสงสว่างตรงแสง (≥ 2.6 ไม่น้อย 3.0)	<input type="checkbox"/>
Automatic Titrator			
<input type="checkbox"/>	<input type="checkbox"/>	18. ยานพาหนะ Burettes	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	19. Function Rinsing and Dosing	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	20. ระบบจ่ายสารละลายอัตโนมัติ	<input type="checkbox"/>

ชื่อผู้ตรวจ:

Mr. Pongsit Suebchanha
Service Engineer

Unit Addressed: 25001501
DKSH Technology Limited
2500 Sukhumvit Road, Bangkok, Thailand 10110
Phone: +66 2039 7100 Email: info@dksh.com

Delivering Growth - in Asia and Beyond

CAL-FM-R31-03: 26 Jul 2024

Certificate No.: C15250430

Page: 2 of 2



Certificate of Calibration

Equipment: Digital Thermometer with Probe
Model: Orion STAR A215
Serial No.: X58821
Manufacturer: Thermo Scientific
ID No.: RYG-EN0200

Certificate No.: C15250430
Issued Date: 21 March 2025
Job No.: WO-00064803
Page: 1 of 2
Condition: In Condition

Customer: ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
616/10 Moo 5 T. Maenam Klu,
A. Phrakdaeng, Rayong 21140, Thailand.

Environment Condition: Temperature: 30 °C \pm 10 °C
Humidity: 55 %RH \pm 25 %RH
Voltage: 220 VAC \pm 10 %

Calibration Place: ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
(Wei Chemistry Lab) 616/10 Moo 5 T. Maenam Klu,
A. Phrakdaeng, Rayong 21140, Thailand.

Calibration By: Mr. Piypat Saidoung
Calibration Date: 21 March 2025

The Method used: In house method, CAL-WI-59, by comparison with standard thermometer

Traceability: This certificate is traceable to the International System of Unit maintained by:
Quality Reborn Co., Ltd. (QR)

(Mr. Piypat Saidoung)
Person in charge

(Mr. Tiewong Thaitiang)
Authorized signatory

This certificate is issued to the user of measurement according to the International System of Units (SI). It provides traceability of measurement to international or national standards or other recognized national standard laboratories.
The measurement uncertainty stated in 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.

Reference standard equipment:

Equipment	Certificate no	Cal. date	Next Cal. date
Digital Thermometer with Probe	QR24-2043	21 August 2024	21 August 2025

Calibration Results:

Without Adjustment

Sensor Type: RTD		Electrode Serial No. CS1-11923		Channel: -	
Diameter (mm): 15		Length (mm): 120		Immersion (mm): 110	
Calibrate Point (°C)	STD. Reading (°C)	UUC. Reading (°C)	Correction of UUC (°C)	Uncertainty (± °C)	
25.0	24.954	24.9	0.054	0.20	

The End of Certificate

Unit Addressed: 25001501
DKSH Technology Limited
2500 Sukhumvit Road, Bangkok, Thailand 10110
Phone: +66 2039 7100 Email: info@dksh.com

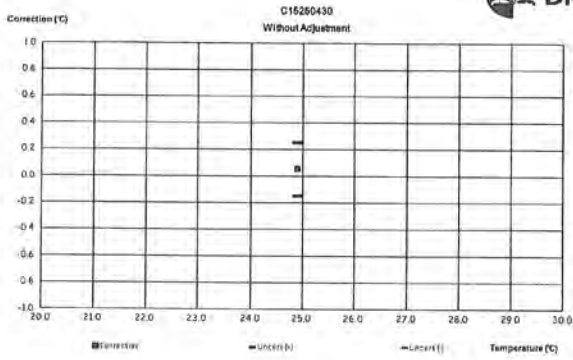
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CAL-FM-C15-14: 06 Dec 2022

Unit Addressed: 25001501
DKSH Technology Limited
2500 Sukhumvit Road, Bangkok, Thailand 10110
Phone: +66 2039 7100 Email: info@dksh.com

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CAL-FM-C15-14: 06 Dec 2022



ใบตรวจสอบสภาพเครื่องมือวัดอุณหภูมิ

Equipment : Digital Thermometer with Probe
Serial No. : X58821

Certificate No. : C15250430
Model : Orion STAR A215

ตรวจสอบ (วัน)		รายการตรวจเช็ค	ตรวจสอบ (ตั้ง)		หมายเหตุ
21-Mar-2025			21-Mar-2025		
ปกติ	ไม่ปกติ		ปกติ	ไม่ปกติ	
		General			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. สายไฟ	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. Adapter / Power supply 220 / 110 VAC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. การทำงาน Main Switch	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. การทำงาน Selector Key	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. การแสดงหลอด Display	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	6. Battery	<input type="checkbox"/>	<input type="checkbox"/>	ไม่มี
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7. สภาพหัวเครื่องมือ	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. สภาพ Airbag Sensor (In / Ex)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

ชื่อเจ้าหน้าที่ : _____

Mr. Piyeapat Saldoung
Service Engineer

Delivering Growth -- In Asia and Beyond.

บริษัท ดีเคเอส อีเซีย จำกัด
DKSH Technology Limited
2533 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
2533 Sukhumvit Road, Bangkok, Bangkok 10110
Phone: +66 2839 7500 Email: info.asia@dksh.com Website: www.dksh.com/asia/thailand

Delivering Growth -- In Asia and Beyond.

ภาคผนวก จ

สำเนาหนังสือใบอนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

ลำดับที่	สารเคมี	วิธีการตรวจ
19	Copper	1) Digestion, Inductively Coupled Plasma Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
20	Cyanide	Distillation, Colorimetric Method ⁽¹⁾
21	2,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
22	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
23	2,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
24	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
25	2,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
26	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
27	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
28	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
29	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
30	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
31	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
32	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
33	Formaldehyde	Distillation, Colorimetric Method ⁽¹⁾
34	Free Chlorine	1) DPD Ferrous Titrimetric Method ⁽¹⁾ 2) DPD Colorimetric Method ⁽²⁾
35	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
36	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
37	Hexavalent Chromium	Colorimetric Method ⁽¹⁾
38	3-Hydroxycarbofuran	High-Performance Liquid Chromatographic Method ⁽¹⁾
39	Lead	1) Digestion, Inductively Coupled Plasma Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾

40 Manganese...

ลำดับที่	สารเคมี	วิธีการตรวจ
40	Manganese	1) Digestion, Inductively Coupled Plasma Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
41	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
42	Methiocarb	High-Performance Liquid Chromatographic Method ⁽¹⁾
43	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
44	Methomyl	High-Performance Liquid Chromatographic Method ⁽¹⁾
45	Nickel	1) Digestion, Inductively Coupled Plasma Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
46	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method ⁽¹⁾ 2) Soxhlet Extraction Method ⁽²⁾
47	Oxamyl	High-Performance Liquid Chromatographic Method ⁽¹⁾
48	Propoxur	High-Performance Liquid Chromatographic Method ⁽¹⁾
49	pH	Electrometric Method ⁽¹⁾
50	Phenols	1) Distillation, Chloroform Extraction Method ⁽¹⁾ 2) Distillation, Direct Photometric Method ⁽²⁾
51	Selenium	1) Digestion, Inductively Coupled Plasma Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
52	Sulfide	Iodometric Method ⁽¹⁾
53	Temperature	Laboratory and Field Methods ⁽¹⁾
54	Total Dissolved Solids	Dried at 180 °C ⁽¹⁾
55	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method ⁽¹⁾
56	Total Phosphorous	Digestion, Colorimetric Method ⁽¹⁾
57	Total Suspended Solids	Dried from 103-105 °C ⁽¹⁾
58	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
59	Trivalent Chromium	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ⁽²⁾
60	Zinc	1) Digestion, Inductively Coupled Plasma Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾

น้ำดื่ม...

น้ำดื่ม จำนวน 126 รายการ

ลำดับที่	สารเคมี	วิธีการตรวจ
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
8	Barium	1) Digestion, Inductively Coupled Plasma Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
9	Benz(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
13	Benzic Acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
15	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾

18 Bis(2-ethylhexyl)phthalate...

ลำดับที่	สารเคมี	วิธีการตรวจ
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
20	Bromocloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
27	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽²⁾
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ⁽²⁾
35	Chromium (VI)	Colorimetric Method ⁽¹⁾

36 Chrysene...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
36	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
37	Cyanide	Distillation, Colorimetric Method ⁽⁸⁾
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
39	DDO	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
40	DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
41	DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
42	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
43	Di-n-Butyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
47	3,3-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾

55 1,3-Dichloropropane...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
57	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
58	Diethyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
60	2,6-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
63	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
64	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
65	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
69	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
70	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
74	α-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
75	β-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾

76 γ-HCH...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
76	γ-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
81	Lead	1) Digestion, Inductively Coupled Plasma Method ⁽⁹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁹⁾
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ⁽⁹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁹⁾
83	Mercury	1) Digestion, Cold Vapor Atomic Absorption/ Spectrometric Method ⁽⁹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁹⁾
84	Methanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
86	Methy. bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
87	Methylene chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
90	Methyl tert-butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ⁽⁹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁹⁾
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾

94 N-Nitrosodiphenylamine...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
95	N-Nitrosodi-n-Propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
96	Polychlorinated Biphenyls	- PCB 1016 - PCB 1221 - PCB 1232 - PCB 1242 - PCB 1248 - PCB 1254 - PCB 1260
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
98	pH	Electrometric Method ⁽⁶⁾
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
100	Phenol	1) Distillation, Chloroform Extraction Method ⁽⁹⁾ 2) Distillation, Direct Photometric Method ⁽⁹⁾ 3) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
102	Selenium	1) Digestion, Inductively Coupled Plasma Method ⁽⁹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁹⁾
103	Silver	1) Digestion, Inductively Coupled Plasma Method ⁽⁹⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁹⁾
104	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
105	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
106	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
107	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
108	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾
109	TPH (C ₈ -C ₁₀)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁹⁾

110 TPH (C₈-C₁₀)...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
110	TPH ($C_{10}-C_{26}$)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^{1,20}
111	TPH ($C_{10}-C_{26}$)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^{1,20}
112	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁴
113	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁴
114	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁴
115	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁴
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁴
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁴
118	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁴
119	Vanadium	1) Digestion, Inductively Coupled Plasma Method ¹³ 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
120	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁴
121	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁴
122	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁴
123	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁴
124	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁴
125	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁴
126	Zinc	1) Digestion, Inductively Coupled Plasma Method ¹³ 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴

หมายเหตุ...

ภาคผนวก ก (ปด) (ฉบับแก้ไข) จำนวน 28 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ²¹ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
2	Arsenic	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ²¹ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
3	Beryllium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ²¹ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
4	Cadmium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ²¹ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
5	Carbon Monoxide	1) Instrumental Analyzer Method ¹⁵ 2) Sampling Bag Non-Dispersive Infrared Method ²³
6	Chlorine	1) Absorption Sampling, Ion Chromatographic Method ¹⁸ 2) Isokinetic Sampling, Ion Chromatographic Method ¹⁸
7	Chromium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ²¹ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
8	Cobalt	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ²¹ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
9	Copper	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ²¹ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
10	Cresol	Absorption Sampling, Gas Chromatographic Method ²³
11	Dioxins	Isokinetic Sampling ¹⁹
12	Hydrogen Chloride	1) Absorption Sampling, Ion Chromatographic Method ¹⁸ 2) Isokinetic Sampling, Ion Chromatographic Method ¹⁸
13	Hydrogen Fluoride	1) Absorption Sampling, Ion Chromatographic Method ¹⁸ 2) Isokinetic Sampling, Ion Chromatographic Method ¹⁸
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ²³

15 Lead...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
15	Lead	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ²¹ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
16	Manganese	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ²¹ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
17	Mercury	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ²¹ 2) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ²¹
18	Nickel	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ²¹ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
19	Opacity	Ringelmann's Method ²³
20	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ²³ 2) Absorption Sampling, Alkaline Permanganate/Colorimetric Method ²³ 3) Instrumental Analyzer Method ²³
21	Selenium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ²¹ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
22	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ²³ 2) Instrumental Analyzer Method ²³
23	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ²³
24	Tellurium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ²¹ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
25	Tin	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ²¹ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
26	Total Suspended Particulate	1) Isokinetic Sampling, Gravimetric Method ²³ 2) Paired Train, Isokinetic Sampling, Gravimetric Method ²³

27 Vanadium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Vanadium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ²¹ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁴
28	Xylene	Absorption Sampling, Gas Chromatographic Method ²³

ภาคผนวก ก (ปด) (ฉบับแก้ไข) จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^{1,2,20} 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^{1,2,20} 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^{1,2,20}
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^{2,4,10} 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^{2,4,10} 3) Digestion, Inductively Coupled Plasma Method ^{2,10} 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^{2,10}
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^{2,4,10} 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^{2,4,10} 3) Digestion, Inductively Coupled Plasma Method ^{2,10} 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^{2,10}
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^{2,4,10} 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^{2,4,10} 3) Digestion, Inductively Coupled Plasma Method ^{2,10} 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^{2,10}

5 Beryllium...

ลำดับที่	สารเคมี	วิธีการตรวจ
28	- 2-Chlorobiphenyl - 2,3-Dichlorobiphenyl - 2,2',5'-Trichlorobiphenyl - 2,4',5'-Trichlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',3,4,6'-Pentachlorobiphenyl - 2,2',3,4,5'-Hexachlorobiphenyl - 2,2',3,4,5,6'-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5'-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5,6'-Heptachlorobiphenyl - 2,2',3,4,5,5',6'-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6'-Nonachlorobiphenyl Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,2,3) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28) Electrometric Method ^(7,29) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
29	pH	
30	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,4,14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(2,4,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,18) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)

31 Silver...

ลำดับที่	สารเคมี	วิธีการตรวจ
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,4,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,4,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,18) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,4,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,4,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,18) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(7,8,24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28)
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,4,18) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,4,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,18) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
35	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,4,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,4,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,18) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)

ดิน...

สืบ จำนวน 129 รายการ

ลำดับที่	สารเคมี	วิธีการตรวจ
1	Acenaphthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28)
2	Acetone	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(11,29) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(7,30)
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28)
4	Anthracene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28)
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28)
8	Barium	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
9	Benzo(a)anthracene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28)
10	Benzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,25)

11 Benzo(b)fluoranthene

ลำดับที่	สารเคมี	วิธีการตรวจ
11	Benzo(b)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28)
12	Benzo(k)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28)
13	Benzoic acid	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28)
14	Benzo(a)pyrene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28)
15	Benzo(g,h,i)perylene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28)
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
17	Bis(2-chloroethyl)ether	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28)
18	Bis(2-ethylhexyl)phthalate	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28)
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,25)
20	Bromoform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,25)
21	Butanol	Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(7,30)
22	Butyl Benzyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,28)

23 Cadmium...

ลำดับที่	สารเคมี	วิธีการตรวจ
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^(1,14) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(1,17)
24	Carbazole	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
28	p-Chloroaniline	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
32	2-Chlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^(1,14) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(1,17)
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method/ Alkaline Digestion, Colorimetric Method, Calculation Method ^(1,14,19) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(1,17,19)
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^(1,19)

36 Chrysene...

ลำดับที่	สารเคมี	วิธีการตรวจ
36	Chrysene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
37	Cyanide	Extraction, Distillation, Colorimetric Method ^(1,25,29)
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
39	DDD	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
40	DDF	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
41	DDT	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
42	Dibenz(a,h)anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
43	Di-n-Butyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
47	3,3-Dichlorobenzidine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)

49 1,2-Dichloroethane...

ลำดับที่	สารเคมี	วิธีการตรวจ
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
53	2,4-Dichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
58	Diethyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
59	2,4-Dimethylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
60	2,4-Dinitrophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
61	2,4-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
62	2,6-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)

63 Di-n-Octyl Phthalate...

ลำดับที่	สารเคมี	วิธีการตรวจ
63	Di-n-Octyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
67	Fluorethane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
68	Fluorene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
70	Heptachlor epoxide	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(1,28)
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)
73	n-Hexane	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(1,23) 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^(1,23)

73 n-Hexane...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
74	α -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
75	β -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
76	γ -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
77	Hexachlorocyclopentadiene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
78	Hexachloroethane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
79	Indeno[1,2,3-cd]pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
80	Isophrone	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
81	Lead	1) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁷⁾⁽¹¹⁾
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁷⁾⁽¹¹⁾
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁸⁾ 2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry ⁽²⁾⁽¹⁾ 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽³⁾⁽⁸⁾

84 Methanol...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
85	Methoxychlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
88	2-methylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
89	2-Methylnaphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
91	Naphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁷⁾⁽¹¹⁾
93	Nitrobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
94	N-Nitrosodiphenylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
95	N-Nitrosodi-n-propylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾

96 Polychlorinated biphenyls (PCBs)

ลำดับที่	สารเคมี	วิธีวิเคราะห์
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,2',3,4',6-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6'-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5'-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5',6'-Heptachlorobiphenyl - 2,2',3,4',5,5',6'-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6'-Nonachlorobiphenyl Pentachlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽³⁾⁽⁸⁾
97	Phenanthrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
98	Phenanthrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾

99 Phenol...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
99	Phenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
100	Pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
101	Selenium	1) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁷⁾⁽¹¹⁾
102	Silver	1) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁷⁾⁽¹¹⁾
103	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
108	TPH (C ₉ -C ₁₀)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
109	TPH (C ₉ -C ₁₀)	1) Automated Extraction, Gas Chromatographic Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Solvent Extraction, Gas Chromatographic Method ⁽¹⁾⁽²⁾⁽³⁾ 3) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁾⁽²⁾⁽³⁾
110	TPH (C ₁₀ -C ₁₅)	1) Automated Extraction, Gas Chromatographic Method ⁽¹⁾⁽²⁾⁽³⁾ 2) Solvent Extraction, Gas Chromatographic Method ⁽¹⁾⁽²⁾⁽³⁾ 3) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁾⁽²⁾⁽³⁾
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾

115 2,4,5-Trichlorophenol...

ที่ อก ๐๓๐๑(๑)/ ๒๕๐๘



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๑ สิงหาคม ๒๕๖๘

เรื่อง เปลี่ยนแปลงสารเคมีที่วิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอใบสารเคมีของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๗ มิถุนายน ๒๕๖๘

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารเคมีที่วิเคราะห์

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๖ แผ่น

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอแจ้งปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๑๔ สภาวิชาชีพที่ ๓๐๔ ขอพัฒนาการ ๔๐ ฉบับพัฒนาการ แล่งพัฒนาการ
เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงสารเคมีที่วิเคราะห์ คือกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด
เพิ่มขอขยายชนิดสารเคมีที่วิเคราะห์ในน้ำได้ดิน สิ่งปฏิกูลและวัสดุที่ไม่ได้ดิน และดิน ตามสิ่งที่ส่งมาด้วย

อนึ่ง หนังสือฉบับนี้จะมีผลใช้บังคับเมื่อพ้นกำหนดอายุที่ขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒ กันยายน ๒๕๖๘

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นางสาวปัทมวรรณ คุณประเสริฐ)
ผู้อำนวยการกองขึ้นทะเบียนและออกใบอนุญาต
ปฏิบัติการของกรมโรงงานอุตสาหกรรม

กองวิจัยและเฝ้าระวังมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๕๖๒ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๖๒ ๖๓๑๒ ต่อ ๒๑๑๔

ไปรษณีย์อิเล็กทรอนิกส์ sarabon@div.mol.go.th



"อุตสาหกรรมก้าวไกล ประเทภัยกับธรรมชาติ ร่วมกันพัฒนาอุตสาหกรรมสีเขียว"



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารเคมีที่วิเคราะห์

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๒๐๑๔

ที่ อก ๐๓๐๑(๑)/ ๒๕๐๘ ลงวันที่ ๒๑ สิงหาคม ๒๕๖๘

ขอขยายสารเคมีที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๔๐ รายการ

น้ำได้ดิน จำนวน ๔ รายการ

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

สิ่งปฏิกูลหรือวัสดุที่ไม่ได้ดิน จำนวน 17 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
2	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
3	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)

Beryllium

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ลำดับที่	สารเคมี	วิธีวิเคราะห์
4	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
5	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
6	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
7	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1,3,4,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1,3,7,8) 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(4,5,6,8) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(4,5,7,8)
8	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7)

3) Digestion...

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ลำดับที่	สารเคมี	วิธีวิเคราะห์
9	Copper	3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
10	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
11	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
12	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
13	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)

14 Silver...

ลำดับที่	สารเคมี	วิธีการวิเคราะห์
14	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,7) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
15	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,7) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
16	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,7) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
17	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,7) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)

คืน จำนวน 19 รายการ

ลำดับที่	สารเคมี	วิธีการวิเคราะห์
1	Aluminum	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
2	Antimony	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)

3 Arsenic...

ลำดับที่	สารเคมี	วิธีการวิเคราะห์
3	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
4	Barium	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
5	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
6	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
7	Chromium	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
8	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(3,4,6) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(3,4,6)
9	Copper	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
10	Iron	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
11	Lead	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
12	Manganese	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
13	Molybdenum	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
14	Nickel	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)

15 pH...

ลำดับที่	สารเคมี	วิธีการวิเคราะห์
15	pH	Electrometric Method ⁽⁷⁾
16	Selenium	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
17	Silver	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
18	Vanadium	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
19	Zinc	1) Digestion, Inductively Coupled Plasma Method ^(4,7) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)

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ที่ กอ.๑๗๖๑๒๕๐ ๑ ๑

กรมโรงงานอุตสาหกรรม
เลขที่ ๖ แขวงทุ่งพญาไท
ถนนพหลโยธิน กรุงเทพฯ ๑๐๕๐๐

๒๖ กันยายน ๒๕๖๘

เรื่อง เปลี่ยนแปลงบุคลากร ชื่อตัวและชื่อสกุลของบุคลากร

เรียน กรรมการผู้จัดการ บริษัท เอนเทล แอสโซซิเอตส์ กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอเสนอเปลี่ยน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอพิจารณาสิทธิขององค์กรปฏิบัติการวิเคราะห์และทดสอบ

วันที่ ๒๕ สิงหาคม ๒๕๖๘

ตามที่คำขอที่อ้างถึง บริษัท เอนเทล แอสโซซิเอตส์ กรุ๊ป (ประเทศไทย) จำกัด ขอปฏิบัติการวิเคราะห์และทดสอบ โดยขอเปลี่ยน ๖-๒๕๖๘ สถานะที่ ดังเลขที่ ๑๐๔๔ ขอขออนุมัติการ ๕๐ แบบฟอร์มการตรวจพบผลการ การทดสอบ การเปลี่ยนแปลงบุคลากร ชื่อตัวและชื่อสกุลของบุคลากร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์และทดสอบ จำนวน ๒ ราย

๒. นางสาวพญาดิษฐ์ คุณงาม และนายณัฐกร ๒๕๖๘-๑-๐๖๗๘

๓. นางสาวอรนิตา เกษมคำ และนายณัฐกร ๒๕๖๘-๑-๐๖๗๘

๔. ให้เปลี่ยนชื่อตัวและชื่อสกุลของเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์และทดสอบ จากเดิม นายอาทิตย์ ศรีเสน เป็น นายรัฐธีร์ ทวีจิระพงษ์ และเปลี่ยนเลขที่ ๒๕๖๘-๑-๐๖๗๘

อนึ่ง หนังสือฉบับนี้จะมีผลตั้งแต่วันที่ออกให้ใช้แทนหนังสือปฏิบัติการวิเคราะห์และทดสอบ

ในวันที่ ๒ กันยายน ๒๕๖๘

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

๓

(นายสมชาย วัฒนาวรรณ คุณประเสริฐ)
ผู้อำนวยการกองส่งเสริมและคุ้มครองสิ่งแวดล้อม
กรมโรงงานอุตสาหกรรม

กองวิจัยและพัฒนาสิ่งแวดล้อมโรงงาน

กลุ่มงานฐานปฏิบัติการวิเคราะห์และทดสอบ, สหกิจและระบบห้องปฏิบัติการ

โทร. ๐ ๒๕๖๐ ๖๐๑๒ ต่อ ๑๐๖๖๕

โทรสาร ๐ ๒๕๖๐ ๖๐๑๒ ต่อ ๒๕๖๖๕

ไปรษณีย์อิเล็กทรอนิกส์ ssa@mgr.go.th, ssa@mgr.go.th



"อุตสาหกรรมก้าวหน้า ประสิทธิภาพก้าวหน้า รวมกันพัฒนา อุตสาหกรรมไทย"





๒๕ พฤษภาคม ๒๕๖๕

เรื่อง เปลี่ยนแปลงชื่อ สกุลบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอลเอส แอนด์อราทอรี่ กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ปล่อยอายุ/เปลี่ยนแปลงบุคลากร และขอขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์ภายนอก
ลงวันที่ ๑๕ พฤษภาคม ๒๕๖๔

ตามที่ขอขึ้นทะเบียน บริษัท เอลเอส แอนด์อราทอรี่ กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์ภายนอก เลขทะเบียน ๖-๓๒๓ สถานที่ยื่นเลขที่ ๖๓๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้ อำเภอปลวกแดง
จังหวัดระยอง ขอเปลี่ยนแปลงชื่อ-สกุลบุคลากร ตามรายละเอียดดังนี้

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้เปลี่ยนแปลงชื่อ-สกุลบุคลากร จำนวน ๓ ราย
ตามรายละเอียดดังต่อไปนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายประทีป คำทรง)

ผู้อำนวยการกองควบคุมและส่งเสริมความปลอดภัย
ปฏิสถานประกอบขึ้นทะเบียนโรงงานอุตสาหกรรม

ศูนย์วิจัยและพัฒนาสิ่งแวดล้อมโรงงานภาคตะวันออก

โทร ๐ ๓๓๓๓ ๖๐๕๕ ต่อ ๕๐๓๓-๒

ไปรษณีย์อิเล็กทรอนิกส์ envw@dy.mae.go.th



"อุตสาหกรรมก้าวไกล ประเทไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



๐๒ ธันวาคม ๒๕๖๕

เรื่อง เปลี่ยนแปลงสารมลพิษที่วิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอลเอส แอนด์อราทอรี่ กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ปล่อยอายุ/เปลี่ยนแปลงบุคลากร และขอขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์นอก
ลงวันที่ ๑๓ ตุลาคม ๒๕๖๔

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายขอเปลี่ยนแปลงสารมลพิษที่วิเคราะห์

บริษัท เอลเอส แอนด์อราทอรี่ กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๒ แผ่น

ตามที่ขอขึ้นทะเบียน บริษัท เอลเอส แอนด์อราทอรี่ กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์ภายนอก เลขทะเบียน ๖-๓๒๓ สถานที่ยื่นเลขที่ ๖๓๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้ อำเภอปลวกแดง
จังหวัดระยอง ขอเปลี่ยนแปลงสารมลพิษที่วิเคราะห์ ต่อกรมโรงงานอุตสาหกรรม ดังนี้

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอลเอส แอนด์อราทอรี่ กรุ๊ป (ประเทศไทย) จำกัด
เพิ่มขอเข้าขึ้นทะเบียนสารมลพิษที่วิเคราะห์ในน้ำเสีย และน้ำใต้ดิน ตามสิ่งที่ส่งมาด้วย

อนึ่ง หนังสือฉบับนี้ขึ้นอยู่หรือมีผลผูกพันกับทะเบียนห้องปฏิบัติการวิเคราะห์ภายนอก
ในวันที่ ๒๔ มิถุนายน ๒๕๖๕

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นางสาวปัทมวรรณ กุศลประเสริฐ)

ผู้อำนวยการกองควบคุมและส่งเสริมความปลอดภัย
ปฏิสถานประกอบขึ้นทะเบียนโรงงานอุตสาหกรรม

กองวิจัยและพัฒนาสิ่งแวดล้อมโรงงาน

ศูนย์วิจัยและพัฒนาสิ่งแวดล้อมโรงงานภาคตะวันออก

โทร ๐ ๓๓๓๓ ๖๐๕๕ ต่อ ๕๐๐๓-๒

ไปรษณีย์อิเล็กทรอนิกส์ envw@dy.mae.go.th



"อุตสาหกรรมก้าวไกล ประเทไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษที่วิเคราะห์

บริษัท เอลเอส แอนด์อราทอรี่ กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๓๒๓

ที่ อก ๐๓๓๐(๓)/ ๕๕๖ ๕ ลงวันที่ ๐๒ ธันวาคม ๒๕๖๕

ขอเข้าขึ้นทะเบียนสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๓ รายการ

น้ำดื่ม จำนวน 13 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Arsenic	Digestion, Inductively Coupled Plasma Method
2	Barium	Digestion, Inductively Coupled Plasma Method
3	Cadmium	Digestion, Inductively Coupled Plasma Method
4	Chromium	Digestion, Inductively Coupled Plasma Method
5	Copper	Digestion, Inductively Coupled Plasma Method
6	Hexavalent Chromium	Colorimetric Method
7	Lead	Digestion, Inductively Coupled Plasma Method
8	Manganese	Digestion, Inductively Coupled Plasma Method
9	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method
10	Nickel	Digestion, Inductively Coupled Plasma Method
11	Selenium	Digestion, Inductively Coupled Plasma Method
12	Trivalent Chromium	Calculation
13	Zinc	Digestion, Inductively Coupled Plasma Method

น้ำใต้ดิน จำนวน 20 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aluminum	Digestion, Inductively Coupled Plasma Method
2	Antimony	Digestion, Inductively Coupled Plasma Method
3	Arsenic	Digestion, Inductively Coupled Plasma Method
4	Barium	Digestion, Inductively Coupled Plasma Method
5	Beryllium	Digestion, Inductively Coupled Plasma Method
6	Cadmium	Digestion, Inductively Coupled Plasma Method
7	Chromium	Digestion, Inductively Coupled Plasma Method
8	Chromium (III)	Calculation
9	Chromium (VI)	Colorimetric Method
10	Copper	Digestion, Inductively Coupled Plasma Method

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Iron	Digestion, Inductively Coupled Plasma Method
12	Lead	Digestion, Inductively Coupled Plasma Method
13	Manganese	Digestion, Inductively Coupled Plasma Method
14	Mercury	Digestion Cold-Vapor Atomic Absorption Spectrometric Method
15	Molybdenum	Digestion, Inductively Coupled Plasma Method
16	Nickel	Digestion, Inductively Coupled Plasma Method
17	Selenium	Digestion, Inductively Coupled Plasma Method
18	Silver	Digestion, Inductively Coupled Plasma Method
19	Vanadium	Digestion, Inductively Coupled Plasma Method
20	Zinc	Digestion, Inductively Coupled Plasma Method

เอกสารอ้างอิง

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



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