

ภาคผนวก ค

ใบรับรองผลการตรวจวิเคราะห์คุณภาพสิ่งแวดล้อม

ภาคผนวก ค-1

คุณภาพอากาศจากแหล่งกำเนิด



Analysis / Test Report



TESTING
No.0042

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23106503

Date Received : Sep 18, 2023
Date Reported : Sep 26, 2023
Report Number: 2773627-1

Page 1 of 2

Sample Number 23106503-1
Sampled Date Sep 18, 2023
Sample Description Emission from Stationary Source
Location Reactor Feed Heater (AF-7)
Date Analysis Commenced Sep 19, 2023
Condition of Sample Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one 10-L air sampling bag

Stack Description

Ambient Pressure	756	mmHg	Diameter	1.50	m	Oxygen	5.2	%
Ambient Temperature	33.0	°C	Shape	Circle		Carbon Dioxide	9.1	%
Type of Process	Combustion		Stack Temperature	177	°C	Gas Velocity	3.3	m/s
Type of Fuel	Natural Gas		Moisture	14.02	%	Flow Rate (Actual O2)	11964	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 % O ₂	Result at 5.2 % O ₂	Guideline (1)	Guideline (2)	Method	Testing Location
Total Suspended Particulate	11:30 AM - 12:12 PM	mg/m3	-	0.5	<0.5	<0.5	320	50	United States Environmental Protection Agency, EPA Method 5	Rayong

Guideline :

- Guideline
1).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)
2).Emission Air Standard according to EIA study of SSMC-EBSM Plant, Approval Letter No. Tor Sor 1009.9/579 dated January 20, B.E.2555.

Technical Management

Thanita K.
Thanita Kulsuriwong
Scientist (4)
หมายเลขโทรศัพท์ 3-323-4-9447

Approved by

D. Chongchon
Dej Changchon
Senior Manager
หมายเลขโทรศัพท์ 3-323-4-9442

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Analysis / Test Report



TESTING
No.0042

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23106503

Date Received : Sep 18, 2023
Date Reported : Sep 26, 2023
Report Number: 2773627-1

Page 2 of 2

Sample Number 23106503-1
Sampled Date Sep 18, 2023
Sample Description Emission from Stationary Source
Location Reactor Feed Heater (AF-7)
Date Analysis Commenced Sep 19, 2023
Condition of Sample Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one 10-L air sampling bag

Stack Description

Ambient Pressure	756	mmHg	Diameter	1.50	m	Oxygen	5.2	%
Ambient Temperature	33.0	°C	Shape	Circle		Carbon Dioxide	9.1	%
Type of Process	Combustion		Stack Temperature	177	°C	Gas Velocity	3.3	m/s
Type of Fuel	Natural Gas		Moisture	14.02	%	Flow Rate (Actual O2)	11964	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Total Suspended Particulate *	11:30 AM - 12:12 PM	g/s	-	-	<0.002	-	0.41	Calculated	Rayong

Guideline :

- Guideline
1).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)
2).Emission Air Standard according to EIA study of SSMC-EBSM Plant, Approval Letter No. Tor Sor 1009.9/579 dated January 20, B.E.2555.

Sampled By : Sittipan Sanachiv

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.

Technical Management

Thanita K.
Thanita Kulsuriwong
Scientist (4)
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Approved by

D. Chongchon
Dej Changchon
Senior Manager
หมายเลขโทรศัพท์ 3-323-4-9442

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4701369059
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23123141
Date Received : Oct 30, 2023
Date Reported : Nov 07, 2023
Report Number: 2817169-1

Page 1 of 1

Sample Number 23123141-1
Sampled Date Oct 30, 2023
Sample Description Emission from Stationary Source
Location Reactor Feed Heater (AF-7) (GPS 47P 0733750, 1404290)
Date Analysis Commenced Oct 31, 2023
Condition of Sample Extracted into one 10-L air sampling bag

Stack Description

Ambient Pressure	758	mmHg	Diameter	1.50	m	Oxygen	5.6	%
Ambient Temperature	33.0	°C	Shape	Circle		Carbon Dioxide	8.2	%
Type of Process	Combustion		Stack Temperature	174	°C	Gas Velocity	3.8	m/s
Type of Fuel	Natural Gas		Moisture	11.36	%	Flow Rate (Actual O2)	14257	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 % O ₂	Result at 5.6 % O ₂	Method	Testing Location
Air Testing								
Methane as Propane	10:25 AM - 10:35 AM	ppm	-	0.4	<0.4	<0.4	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	Rayong
Non-Methane Hydrocarbon as Propane	10:25 AM - 10:35 AM	ppm	-	0.4	0.6	0.66	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	Rayong
Total Hydrocarbon as Propane	10:25 AM - 10:35 AM	ppm	-	0.4	0.6	0.66	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	Rayong

Sampled By : Kantaphon Maneesampan

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

Approved by

Thanita K.
Thanita Kulsuriwong
Scientist (4)

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2321148
Date Received : Sep 18, 2023
Date Reported : Sep 28, 2023
Report Number : 2577246-1

Page 1 of 1

Sample Number 2321148-1
Sample Description Emission from Stationary Source
Location Reactor Feed Heater (AF-7) (GPS 47P 0733750, 1404290)
Measurement Date Sep 18, 2023

Stack Description

Ambient Temperature	33	°C	Diameter	1.50	m	Oxygen	5.16	%
Ambient Pressure	756	mmHg	Shape	Circle		Carbon dioxide	9.06	%
Type of Process	Combustion		Stack Temperature	177	°C	Gas Velocity	3.33	m/s
Type of Fuel	Natural Gas		Moisture	14.01	%	Flow Rate	11980	Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)	
				at Actual O ₂	At 7% O ₂
1	11:30 AM - 11:50 AM	5.17	9.05	25.67	22.68
2	11:51 AM - 12:11 PM	5.14	9.07	25.61	22.60
3	12:12 PM - 12:32 PM	5.17	9.05	25.58	22.60
Average (ppm)				25.62	22.62
Guideline ¹ (ppm)				-	200
Guideline ² (ppm)				-	47
Result (mg/Nm ³)				48.20	42.56
Emission Rate at Actual O ₂ (g/s)				0.1604	
Guideline ² (g/s)				0.9900	
Method				US EPA Method 7E	

Sampled By : Saksit Phaisanphisut
Guideline :
¹ 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)
² Emission Air Standard according to EIA study of EBSM Plant, Approval Letter No. Tor Sor 1009.9/579 dated January 20, 2012 (B.E. 2555)

Technical Management

Wichan Choonharat
Wichan Choonharat
Manager
โทรเลขเบอร์ 7-204-6113

Approved by

Sarayuth Jitranont
Sarayuth Jitranont
Assistant General Manager
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Analysis / Test Report



TESTING
No.0042

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23106868
Date Received : Sep 18, 2023
Date Reported : Sep 26, 2023
Report Number: 2773630-1

Page 1 of 2

Sample Number 23106868-1
Sampled Date Sep 18, 2023
Sample Description Emission from Stationary Source
Location Fired Heater (AF-9) (GPS 47P 0733750, 1404298)
Date Analysis Commenced Sep 19, 2023
Condition of Sample Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one 10-L air sampling bag

Stack Description									
Ambient Pressure	756	mmHg	Diameter	1.60	m	Oxygen	3.8	%	
Ambient Temperature	33.0	°C	Shape	Circle		Carbon Dioxide	9.8	%	
Type of Process	Combustion		Stack Temperature	229	°C	Gas Velocity	5.0	m/s	
Type of Fuel	Natural Gas		Moisture	15.41	%	Flow Rate (Actual O2)	17965	Nm3/hr	

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 % O ₂ at 3.8 % O ₂		Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing										
Total Suspended Particulate	11:30 AM - 12:18 PM	mg/m3	-	0.5	<0.5	<0.5	320	50	United States Environmental Protection Agency, EPA Method 5	Rayong

Guideline :

- Guideline
1).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)
2).Emission Air Standard according to EIA study of SSMC-EBSM Plant, Approval Letter No. Tor Sor 1009.9/579 dated January 20, B.E.2555.

Technical Management

Thanitak.

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Approved by

D. Chongchon

Dej Changchon
Senior Manager
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Analysis / Test Report



TESTING
No.0042

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23106868
Date Received : Sep 18, 2023
Date Reported : Sep 26, 2023
Report Number: 2773630-1

Page 2 of 2

Sample Number 23106868-1
Sampled Date Sep 18, 2023
Sample Description Emission from Stationary Source
Location Fired Heater (AF-9) (GPS 47P 0733750, 1404298)
Date Analysis Commenced Sep 19, 2023
Condition of Sample Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one 10-L air sampling bag

Stack Description									
Ambient Pressure	756	mmHg	Diameter	1.60	m	Oxygen	3.8	%	
Ambient Temperature	33.0	°C	Shape	Circle		Carbon Dioxide	9.8	%	
Type of Process	Combustion		Stack Temperature	229	°C	Gas Velocity	5.0	m/s	
Type of Fuel	Natural Gas		Moisture	15.41	%	Flow Rate (Actual O2)	17965	Nm3/hr	

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	11:30 AM - 12:18 PM	g/s	-	-	<0.002	-	0.47	Calculated	Rayong

Guideline :

- Guideline
1).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)
2).Emission Air Standard according to EIA study of SSMC-EBSM Plant, Approval Letter No. Tor Sor 1009.9/579 dated January 20, B.E.2555.

Sampled By : Kantaphon Maneesampan

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.

Technical Management

Thanitak.

Thanita Kulsuriwong
Scientist (4)
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Approved by

D. Chongchon

Dej Changchon
Senior Manager
โทรศัพท์ 323-9-9442

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23106868
Date Received : Sep 18, 2023
Date Reported : Sep 26, 2023
Report Number: 2773630-2

Page 1 of 1

Sample Number 23106868-1
Sampled Date Sep 18, 2023
Sample Description Emission from Stationary Source
Location Fired Heater (AF-9) (GPS 47P 0733750, 1404298)
Date Analysis Commenced Sep 19, 2023
Condition of Sample Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one 10-L air sampling bag

Stack Description

Ambient Pressure	756	mmHg	Diameter	1.60	m	Oxygen	3.8	%
Ambient Temperature	33.0	°C	Shape	Circle		Carbon Dioxide	9.8	%
Type of Process	Combustion		Stack Temperature	229	°C	Gas Velocity	5.0	m/s
Type of Fuel	Natural Gas		Moisture	15.41	%	Flow Rate (Actual O2)	17965	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 % O ₂	Result at 3.8 % O ₂	Method	Testing Location
Air Testing								
Methane as Propane	11:40 AM - 11:50 AM	ppm	-	0.4	<0.4	<0.4	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	Rayong
Non-Methane Hydrocarbon as Propane	11:40 AM - 11:50 AM	ppm	-	0.4	1.1	1.35	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	Rayong
Total Hydrocarbon as Propane	11:40 AM - 11:50 AM	ppm	-	0.4	1.1	1.35	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	Rayong

Sampled By : Kantaphon Maneesampan

Remark :

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

Approved by

Thanitak

Thanita Kulsuriwong
Scientist (4)

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2321156
Date Received : Sep 18, 2023
Date Reported : Sep 28, 2023
Report Number : 2577249-1

Page 1 of 1

Sample Number 2321156-1
Sample Description Emission from Stationary Source
Location Fired Heater (AF-9) (GPS 47P 0733750, 1404298)
Measurement Date Sep 18, 2023

Stack Description

Ambient Temperature	33	°C	Diameter	1.60	m	Oxygen	3.83	%
Ambient Pressure	756	mmHg	Shape	Circle		Carbon dioxide	9.75	%
Type of Process	Combustion		Stack Temperature	229	°C	Gas Velocity	4.98	m/s
Type of Fuel	Natural Gas		Moisture	15.47	%	Flow Rate	17975	Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)	
				at Actual O ₂	At 7 % O ₂
1	11:30 AM - 11:50 AM	3.80	9.74	31.51	25.62
2	11:51 AM - 12:11 PM	3.92	9.72	31.51	25.79
3	12:12 PM - 12:32 PM	3.79	9.79	31.78	25.81
Average (ppm)		3.83	9.75	31.60	25.74
Guideline ¹ (ppm)				-	200
Guideline ² (ppm)				-	47
Result (mg/Nm ³)				59.46	48.43
Emission Rate at Actual O ₂ (g/s)				0.2969	
Guideline ² (g/s)				1.1400	
Method				US EPA Method 7E	

Sampled By : Sathaporn Thakarn

Guideline : ¹Notification 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)
²Emission Air Standard according to EIA study of EBSM Plant, Approval Letter No. Tor Sor 1009.9/579 dated January 20, 2012 (B.E. 2555)

Technical Management

Wichan Choonharat
Wichan Choonharat
Manager
หมายเลข 7-204-6113

Approved by

Sarayu Jitranont
Sarayu Jitranont
Assistant General Manager
หมายเลข 7-204-64702

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Analysis / Test Report



TESTING
No.0042

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23106869

Date Received : Sep 19, 2023

Date Reported : Sep 27, 2023

Report Number: 2773632-1

Page 1 of 2

Sample Number 23106869-1
Sampled Date Sep 19, 2023
Sample Description Emission from Stationary Source
Location Styrene Furnace
Date Analysis Commenced Sep 20, 2023
Condition of Sample Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one 10-L air sampling bag

Stack Description

Ambient Pressure	756	mmHg	Diameter	2.75	m	Oxygen	6.5	%
Ambient Temperature	30.0	°C	Shape	Circle		Carbon Dioxide	4.2	%
Type of Process	Combustion		Stack Temperature	193	°C	Gas Velocity	6.2	m/s
Type of Fuel	Natural Gas		Moisture	14.09	%	Flow Rate (Actual O2)	72915	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 % O ₂ at 6.5 % O ₂	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate	11:30 AM - 12:18 PM	mg/m3	-	0.5	<0.5	320	60	United States Environmental Protection Agency, EPA Method 5	Rayong

Guideline :

Guideline

- 1).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)
- 2).Emission Air Standard according to EIA study of SSMC-EBSM Plant, Approval Letter No. Tor Sor 1009.9/579 dated January 20, B.E.2555.



Analysis / Test Report



TESTING
No.0042

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23106869

Date Received : Sep 19, 2023

Date Reported : Sep 27, 2023

Report Number: 2773632-1

Page 2 of 2

Sample Number 23106869-1
Sampled Date Sep 19, 2023
Sample Description Emission from Stationary Source
Location Styrene Furnace
Date Analysis Commenced Sep 20, 2023
Condition of Sample Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one 10-L air sampling bag

Stack Description

Ambient Pressure	756	mmHg	Diameter	2.75	m	Oxygen	6.5	%
Ambient Temperature	30.0	°C	Shape	Circle		Carbon Dioxide	4.2	%
Type of Process	Combustion		Stack Temperature	193	°C	Gas Velocity	6.2	m/s
Type of Fuel	Natural Gas		Moisture	14.09	%	Flow Rate (Actual O2)	72915	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	11:30 AM - 12:18 PM	g/s	-	-	<0.010	-	0.92	Calculated	Rayong

Guideline :

Guideline

- 1).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)
- 2).Emission Air Standard according to EIA study of SSMC-EBSM Plant, Approval Letter No. Tor Sor 1009.9/579 dated January 20, B.E.2555.

Sampled By : Jittakorn Sriwasa

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.

Technical Management

Thanita K.

Thanita Kulsuriwong
Scientist (4)
โทรศัพท์ 3-323-4-9447

Approved by

D. Chuan

Dej Changchon
Senior Manager
โทรศัพท์ 3-323-4-9442

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S:\Reports_Air Stack_O2_2GL.rpt (12:41PM)

Technical Management

Thanita K.

Thanita Kulsuriwong
Scientist (4)
โทรศัพท์ 3-323-4-9447

Approved by

D. Chuan

Dej Changchon
Senior Manager
โทรศัพท์ 3-323-4-9442

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4701369059

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23124965

Date Received : Oct 30, 2023

Date Reported : Nov 07, 2023

Report Number: 2817170-1

Sample Number 23124965-1

Sampled Date Oct 30, 2023

Sample Description Emission from Stationary Source

Location Styrene Furnace (GPS 47P 0733853, 1404279)

Date Analysis Commenced Oct 31, 2023

Condition of Sample Extracted into one 10-L air sampling bag

Stack Description

Ambient Pressure	758	mmHg	Diameter	2.75	m	Oxygen	6.8	%
Ambient Temperature	33.0	°C	Shape	Circle		Carbon Dioxide	7.8	%
Type of Process	Combustion		Stack Temperature	166	°C	Gas Velocity	4.6	m/s
Type of Fuel	Natural Gas		Moisture	11.91	%	Flow Rate (Actual O ₂)	58951	Nm ³ /hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7% O ₂	Result at 6.8% O ₂	Method	Testing Location
Air Testing								
Methane as Propane	12:00 PM - 12:10 PM	ppm	-	0.4	<0.4	<0.4	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	Rayong
Non-Methane Hydrocarbon as Propane	12:00 PM - 12:10 PM	ppm	-	0.4	<0.4	<0.4	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	Rayong
Total Hydrocarbon as Propane	12:00 PM - 12:10 PM	ppm	-	0.4	<0.4	<0.4	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	Rayong

Sampled By : Kantaphon Maneesampan

Remark :

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

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S:\Reports_Air Stack_O2_NoGL.rpt (1:31PM)



Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2321157

Date Received : Sep 19, 2023

Date Reported : Sep 28, 2023

Report Number : 2577252-1

Page 1 of 1

Sample Number 2321157-1
Sample Description Emission from Stationary Source
Location Styrene Furnace (GPS 47P 0733853, 1404279)
Measurement Date Sep 19, 2023

Stack Description

Ambient Temperature	30	°C	Diameter	2.75	m	Oxygen	6.46	%
Ambient Pressure	756	mmHg	Shape	Circle		Carbon dioxide	4.25	%
Type of Process	Combustion		Stack Temperature	193	°C	Gas Velocity	6.25	m/s
Type of Fuel	Natural Gas		Moisture	13.98	%	Flow Rate	73080	Nm ³ /hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm) at Actual O ₂	Oxides of Nitrogen (ppm) At 7% O ₂
1	11:30 AM - 11:50 AM	6.41	4.25	40.73	39.09
2	11:51 AM - 12:11 PM	6.50	4.24	41.22	39.78
3	12:12 PM - 12:32 PM	6.47	4.26	41.31	39.78
Average (ppm)		6.46	4.25	41.09	39.55
Guideline ^{1/} (ppm)				-	200
Guideline ^{2/} (ppm)				-	200
Result (mg/Nm ³)				77.30	74.40
Emission Rate at Actual O ₂ (g/s)				1.5692	
Guideline ^{2/} (g/s)				8.2300	
Method				US EPA Method 7E	

Sampled By : Saksit Phaisanphisut

Guideline : ^{1/}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)
^{2/}Emission Air Standard according to EIA study of EBSM Plant, Approval Letter No. Tor Sor 1009.9/579 dated January 20, 2012 (B.E. 2555)

Technical Management

Wichan Choonharat
Manager
หมายเลขโทรศัพท์ 204-6113

Approved by

Sarayuth Jitranont
Assistant General Manager
หมายเลขโทรศัพท์ 204-4702

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ภาคผนวก ค-2

คุณภาพอากาศในบรรยากาศ



Analysis / Test Report



TESTING
No.0042

Lot ID: 23106858

Date Received : Sep 23, 2023

Date Reported : Sep 29, 2023

Report Number: 2773591-1

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand

21150

P/O : 4514155377

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Page 1 of 1

Sample Description	Air Quality
Location	บ้านฉางประจักษ์ (โรงพยาบาลส่งเสริมสุขภาพตำบลตากวน) (GPS 47P 0735531, 1402769)
Date Analysis Commenced	Sep 25, 2023
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Total Suspended Particulate (mg/m ³)	Particulate Matter (PM-10) (mg/m ³)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
23106858-1	Sep 14 - Sep 15, 2023	0.028	0.012	756	30
23106858-2	Sep 15 - Sep 16, 2023	0.026	0.010	756	31
23106858-3	Sep 16 - Sep 17, 2023	0.020	0.010	756	30
23106858-4	Sep 17 - Sep 18, 2023	0.026	0.013	756	31
23106858-5	Sep 18 - Sep 19, 2023	0.026	0.014	756	30
23106858-6	Sep 19 - Sep 20, 2023	0.089	0.034	756	31
23106858-7	Sep 20 - Sep 21, 2023	0.038	0.019	756	30
Guideline		0.33	0.12	-	-

Reference Method

Total Suspended Particulate : US EPA 40 CFR Part 50 Appendix B

Particulate Matter (PM-10) : US EPA 40 CFR Part 50 Appendix J

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

Sampled By : Sitpawit Suwannarat

Remark :

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

Approved by

Thanita K.

Thanita Kulsuriwong
Scientist (4)

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S:\Reports\Air Ambient7Days.rpt (10:14AM)



Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23106850

Date Received : Sep 26, 2023

Date Reported : Sep 30, 2023

Report Number: 2773586-1

Page 1 of 1

Sample Description	Air Quality
Location	บ้านฉางประจักษ์ (โรงพยาบาลส่งเสริมสุขภาพตำบลตากวน) (GPS 47P 0735531, 1402769)
Parameter	Nitrogen dioxide (ppm)
Measurement Date	Sep 14, 2023 - Sep 21, 2023
Measurement by	Sitpawit Suwannarat

Time	23106850-1 Sep 14, 2023	23106850-2 Sep 15, 2023	23106850-3 Sep 16, 2023	23106850-4 Sep 17, 2023	23106850-5 Sep 18, 2023	23106850-6 Sep 19, 2023	23106850-7 Sep 20, 2023
11:00 AM - 12:00 PM	0.010	0.004	0.006	0.010	0.009	0.007	0.007
12:00 PM - 01:00 PM	0.001	0.003	0.004	0.008	0.007	0.007	0.015
01:00 PM - 02:00 PM	0.002	0.003	0.004	0.005	0.006	0.006	0.011
02:00 PM - 03:00 PM	0.003	0.004	0.005	0.004	0.007	0.007	0.009
03:00 PM - 04:00 PM	0.004	0.004	0.006	0.005	0.005	0.006	0.008
04:00 PM - 05:00 PM	0.004	0.004	0.005	0.005	0.007	0.007	0.006
05:00 PM - 06:00 PM	0.004	0.004	0.004	0.006	0.006	0.008	0.007
06:00 PM - 07:00 PM	0.005	0.008	0.005	0.006	0.008	0.010	0.008
07:00 PM - 08:00 PM	0.005	0.006	0.011	0.008	0.011	0.015	0.010
08:00 PM - 09:00 PM	0.007	0.011	0.012	0.014	0.013	0.015	0.014
09:00 PM - 10:00 PM	0.010	0.017	0.014	0.013	0.014	0.016	0.013
10:00 PM - 11:00 PM	0.011	0.014	0.010	0.012	0.012	0.021	0.012
11:00 PM - 12:00 AM	0.012	0.009	0.008	0.009	0.008	0.016	0.014
12:00 AM - 01:00 AM	0.010	0.005	0.007	0.008	0.007	0.010	0.009
01:00 AM - 02:00 AM	0.008	0.005	0.008	0.007	0.008	0.009	0.010
02:00 AM - 03:00 AM	0.008	0.006	0.009	0.010	0.008	0.014	0.008
03:00 AM - 04:00 AM	0.008	0.008	0.007	0.008	0.007	0.009	0.013
04:00 AM - 05:00 AM	0.007	0.006	0.004	0.005	0.005	0.013	0.008
05:00 AM - 06:00 AM	0.005	0.005	0.006	0.008	0.007	0.011	0.011
06:00 AM - 07:00 AM	0.008	0.003	0.010	0.010	0.009	0.013	0.006
07:00 AM - 08:00 AM	0.008	0.004	0.013	0.010	0.015	0.016	0.010
08:00 AM - 09:00 AM	0.011	0.008	0.016	0.015	0.017	0.010	0.013
09:00 AM - 10:00 AM	0.011	0.019	0.021	0.018	0.015	0.014	0.020
10:00 AM - 11:00 AM	0.006	0.009	0.012	0.012	0.009	0.011	0.013
Average	0.007	0.007	0.009	0.009	0.009	0.011	0.011
1hr - Maximum	0.012	0.019	0.021	0.018	0.017	0.021	0.020
Standard 1hr - Average	0.170	0.170	0.170	0.170	0.170	0.170	0.170

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).

Reference Method : US EPA Method Part 50 App. F (Chemiluminescence)

Approved by

Orawan R.

Orawan Rak Yong
Scientist (3)

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S:\Reports\Air SOxNOx.rpt (9:50AM)



Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23106855
Date Received : Sep 26, 2023
Date Reported : Oct 03, 2023
Report Number : 2773588-1

Page 1 of 2

Sample Number 23106855-1 to 7
Parameter Wind Speed / Wind Direction
Location บ้านฉางประจักษ์ (โรงงานผลิตโพลีเอทิลีนสำหรับบรรจุภัณฑ์) (GPS 47P 0735531, 1402769)
Sampling Date Sep 14 - Sep 21, 2023
Sampling by Sitpawit Suwannarat

Time	Sep 14 - Sep 15, 2023			Sep 15 - Sep 16, 2023			Sep 16 - Sep 17, 2023			Sep 17 - Sep 18, 2023			Sep 18 - Sep 19, 2023			Sep 19 - Sep 20, 2023			Sep 20 - Sep 21, 2023		
	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)	
11:00 AM - 12:00 PM	1.4	79.0	E	0.3	157.0	SSE	1.3	60.0	ENE	2.1	118.0	ESE	1.0	76.0	ENE	0.6	106.0	ESE	0.6	175.0	S
12:00 PM - 01:00 PM	0.3	0.0	N	0.3	72.0	ENE	1.0	0.0	N	0.7	101.0	E	0.9	108.0	ESE	0.4	105.0	ESE	1.3	174.0	S
01:00 PM - 02:00 PM	0.3	90.0	E	1.0	170.0	S	1.0	102.0	ESE	2.3	111.0	ESE	0.5	108.0	ESE	0.3	97.0	E	0.3	175.0	S
02:00 PM - 03:00 PM	1.1	115.0	ESE	1.2	95.0	E	1.9	90.0	E	0.8	99.0	E	0.3	87.0	E	0.8	125.0	SE	0.3	175.0	S
03:00 PM - 04:00 PM	0.8	81.0	E	1.0	58.0	ENE	0.6	158.0	SSE	0.2	-	-	0.4	160.0	SSE	0.5	81.0	E	0.5	179.0	S
04:00 PM - 05:00 PM	0.5	0.0	N	0.7	60.0	ENE	0.4	0.0	N	1.1	74.0	ENE	0.6	156.0	SSE	0.3	166.0	SSE	0.3	179.0	S
05:00 PM - 06:00 PM	1.5	81.0	E	1.3	146.0	SE	0.3	149.0	SSE	0.4	120.0	ESE	0.4	105.0	ESE	0.4	166.0	SSE	0.6	179.0	S
06:00 PM - 07:00 PM	0.5	206.0	SSW	1.7	80.0	E	1.0	55.0	NE	3.3	103.0	ESE	0.5	111.0	ESE	0.9	179.0	S	0.8	209.0	SSW
07:00 PM - 08:00 PM	1.3	53.0	NE	3.2	76.0	ENE	0.5	0.0	N	1.3	0.0	N	0.3	117.0	ESE	0.5	151.0	SSE	0.3	227.0	SW
08:00 PM - 09:00 PM	3.5	94.0	E	0.6	99.0	E	1.0	85.0	E	1.9	101.0	E	0.6	83.0	E	1.5	137.0	SE	1.8	0.0	N
09:00 PM - 10:00 PM	1.0	112.0	ESE	1.0	0.0	N	2.0	92.0	E	0.5	120.0	ESE	2.9	115.0	ESE	0.1	-	-	0.6	55.0	NE
10:00 PM - 11:00 PM	2.5	78.0	ENE	0.5	131.0	SE	1.4	87.0	E	1.3	130.0	SE	1.3	88.0	E	1.5	128.0	SE	0.9	129.0	SE
11:00 PM - 12:00 AM	5.5	102.0	ESE	1.9	144.0	SE	1.0	103.0	ESE	0.6	103.0	ESE	2.1	107.0	ESE	1.4	76.0	ENE	0.7	155.0	SSE
12:00 AM - 01:00 AM	2.2	75.0	ENE	2.0	81.0	E	3.1	106.0	ESE	0.3	128.0	SE	0.7	103.0	ESE	0.3	119.0	ESE	2.2	0.0	N
01:00 AM - 02:00 AM	2.8	106.0	ESE	1.3	121.0	ESE	1.9	127.0	SE	2.1	116.0	ESE	1.0	110.0	ESE	0.2	-	-	0.9	0.0	N
02:00 AM - 03:00 AM	0.9	103.0	ESE	4.0	58.0	ENE	0.8	124.0	SE	0.5	86.0	E	0.3	108.0	ESE	0.6	149.0	SSE	0.4	230.0	SW
03:00 AM - 04:00 AM	0.4	110.0	ESE	3.9	99.0	E	0.3	105.0	ESE	2.2	84.0	E	0.7	132.0	SE	1.1	108.0	ESE	0.6	202.0	SSW
04:00 AM - 05:00 AM	0.9	64.0	ENE	2.4	119.0	ESE	0.8	100.0	E	0.7	105.0	ESE	0.3	89.0	E	0.9	177.0	S	0.3	209.0	SSW
05:00 AM - 06:00 AM	0.6	86.0	E	0.6	0.0	N	2.3	94.0	E	0.3	128.0	SE	0.3	108.0	ESE	0.5	152.0	SSE	0.4	213.0	SSW
06:00 AM - 07:00 AM	1.9	137.0	SE	2.2	82.0	E	1.3	0.0	N	0.3	154.0	SSE	0.8	111.0	ESE	0.3	174.0	S	0.3	214.0	SW
07:00 AM - 08:00 AM	1.2	0.0	N	3.8	109.0	ESE	0.8	127.0	SE	0.5	104.0	ESE	0.3	132.0	SE	0.6	175.0	S	0.5	213.0	SSW
08:00 AM - 09:00 AM	0.3	163.0	SSE	1.5	90.0	E	1.3	127.0	SE	0.3	194.0	SSW	0.5	101.0	E	0.3	175.0	S	0.8	215.0	SW
09:00 AM - 10:00 AM	0.6	0.0	N	2.2	112.0	ESE	4.3	100.0	E	0.6	139.0	SE	0.3	99.0	E	0.5	175.0	S	0.7	214.0	SW
10:00 AM - 11:00 AM	0.5	191.0	S	0.3	104.0	ESE	2.9	92.0	E	0.9	111.0	ESE	0.3	113.0	ESE	0.4	175.0	S	0.7	0.0	N

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Approved by

Sarayuth Jittrantorn
Assistant General Manager

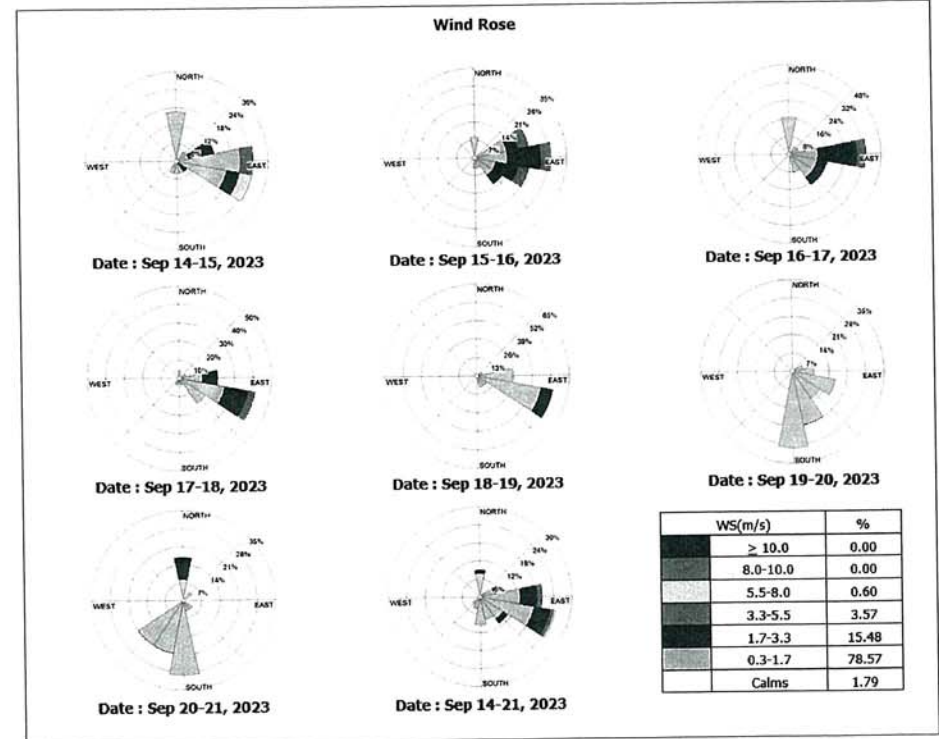


Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23106855
Date Received : Sep 26, 2023
Date Reported : Oct 03, 2023
Report Number : 2773588-1

Page 2 of 2



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Approved by

Sarayuth Jittrantorn
Assistant General Manager



Analysis / Test Report



TESTING
No.0042

Lot ID: 23106861

Date Received : Sep 23, 2023

Date Reported : Sep 29, 2023

Report Number: 2773597-1

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand

21150

P/O : 4514155377

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Sample Description		Air Quality			
Location		บ้านนาหว้า (GPS 47P 0735346, 1406705)			
Date Analysis Commenced		Sep 25, 2023			
Condition of Sample		Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag			
Sample Number	Sampled Date	Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
23106861-1	Sep 14 - Sep 15, 2023	0.033	0.017	756	30
23106861-2	Sep 15 - Sep 16, 2023	0.036	0.015	756	31
23106861-3	Sep 16 - Sep 17, 2023	0.025	0.012	756	30
23106861-4	Sep 17 - Sep 18, 2023	0.037	0.017	756	31
23106861-5	Sep 18 - Sep 19, 2023	0.029	0.017	756	30
23106861-6	Sep 19 - Sep 20, 2023	0.049	0.043	756	31
23106861-7	Sep 20 - Sep 21, 2023	0.033	0.022	756	30
Guideline		0.33	0.12	-	-

Reference Method

Total Suspended Particulate : US EPA 40 CFR Part 50 Appendix B

Particulate Matter (PM-10) : US EPA 40 CFR Part 50 Appendix J

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

Sampled By : Sitpawit Suwannarat

Remark :

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

Approved by

Thanitak.

Thanita Kulsuriwong
Scientist (4)

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S:\Reports\Air Ambient\7Days.rpt (10:36AM)



Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23106851

Date Received : Sep 26, 2023

Date Reported : Sep 30, 2023

Report Number: 2773587-1

Page 1 of 1

Sample Description	Air Quality						
Location	บ้านนาหว้า (GPS 47P 0735346, 1406705)						
Parameter	Nitrogen dioxide (ppm)						
Measurement Date	Sep 14, 2023 - Sep 21, 2023						
Measurement by	Sitpawit Suwannarat						
Time	23106851-1 Sep 14, 2023	23106851-2 Sep 15, 2023	23106851-3 Sep 16, 2023	23106851-4 Sep 17, 2023	23106851-5 Sep 18, 2023	23106851-6 Sep 19, 2023	23106851-7 Sep 20, 2023
10:00 AM - 11:00 AM	0.013	0.016	0.015	0.017	0.019	0.018	0.016
11:00 AM - 12:00 PM	0.014	0.018	0.015	0.017	0.017	0.016	0.015
12:00 PM - 01:00 PM	0.014	0.017	0.015	0.018	0.018	0.017	0.014
01:00 PM - 02:00 PM	0.010	0.016	0.015	0.017	0.017	0.015	0.014
02:00 PM - 03:00 PM	0.010	0.018	0.015	0.017	0.017	0.015	0.013
03:00 PM - 04:00 PM	0.015	0.018	0.016	0.015	0.016	0.014	0.014
04:00 PM - 05:00 PM	0.018	0.018	0.017	0.014	0.017	0.014	0.015
05:00 PM - 06:00 PM	0.012	0.020	0.020	0.017	0.020	0.016	0.016
06:00 PM - 07:00 PM	0.009	0.017	0.025	0.019	0.008	0.017	0.016
07:00 PM - 08:00 PM	0.013	0.015	0.024	0.020	0.012	0.024	0.024
08:00 PM - 09:00 PM	0.012	0.012	0.020	0.020	0.014	0.025	0.024
09:00 PM - 10:00 PM	0.013	0.010	0.018	0.006	0.011	0.022	0.010
10:00 PM - 11:00 PM	0.011	0.014	0.010	0.010	0.011	0.010	0.011
11:00 PM - 12:00 AM	0.008	0.013	0.014	0.008	0.006	0.010	0.012
12:00 AM - 01:00 AM	0.010	0.012	0.011	0.006	0.007	0.011	0.010
01:00 AM - 02:00 AM	0.012	0.014	0.007	0.005	0.007	0.012	0.008
02:00 AM - 03:00 AM	0.013	0.009	0.008	0.006	0.009	0.009	0.011
03:00 AM - 04:00 AM	0.010	0.010	0.010	0.007	0.008	0.011	0.012
04:00 AM - 05:00 AM	0.008	0.008	0.008	0.007	0.008	0.011	0.014
05:00 AM - 06:00 AM	0.012	0.013	0.004	0.011	0.007	0.023	0.007
06:00 AM - 07:00 AM	0.012	0.014	0.019	0.017	0.015	0.027	0.008
07:00 AM - 08:00 AM	0.013	0.015	0.018	0.018	0.017	0.023	0.007
08:00 AM - 09:00 AM	0.013	0.016	0.018	0.019	0.019	0.020	0.011
09:00 AM - 10:00 AM	0.014	0.016	0.018	0.020	0.019	0.017	0.009
Average	0.012	0.015	0.015	0.014	0.013	0.017	0.013
1hr - Maximum	0.018	0.020	0.025	0.020	0.020	0.027	0.024
Standard 1hr - Average	0.170	0.170	0.170	0.170	0.170	0.170	0.170

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).

Reference Method : US EPA Method Part 50 App. F (Chemiluminescence)

Approved by

Orawan R.

Orawan Rakhyong
Scientist (3)

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23106856
Date Received : Sep 26, 2023
Date Reported : Oct 03, 2023
Report Number : 2773590-1

Page 1 of 2

Sample Number : 23106856-1 to 7
Parameter : Wind Speed / Wind Direction
Location : บ้านนาตาทุต (GPS 47P 0735346, 1406705)
Sampling Date : Sep 14 - Sep 21, 2023
Sampling by : Sitpawit Suwannarat

Time	Sep 14 - Sep 15, 2023		Sep 15 - Sep 16, 2023		Sep 16 - Sep 17, 2023		Sep 17 - Sep 18, 2023		Sep 18 - Sep 19, 2023		Sep 19 - Sep 20, 2023		Sep 20 - Sep 21, 2023	
	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	0.3	33.0	NNE	0.3	38.0	NE	0.9	190.0	S	2.0	89.0	E	1.2	244.0
11:00 AM - 12:00 PM	0.3	92.0	E	0.8	52.0	NE	0.6	144.0	SE	1.7	7.0	N	0.6	195.0
12:00 PM - 01:00 PM	0.5	11.0	N	0.3	222.0	SW	1.8	112.0	ESE	1.4	207.0	SSW	0.3	125.0
01:00 PM - 02:00 PM	0.3	157.0	SSE	0.3	80.0	E	0.5	228.0	SW	0.6	237.0	WSW	0.5	166.0
02:00 PM - 03:00 PM	0.6	1.0	N	0.4	106.0	ESE	1.5	85.0	E	0.9	101.0	E	0.3	33.0
03:00 PM - 04:00 PM	0.6	206.0	SSW	0.7	157.0	SSE	2.3	179.0	S	1.0	208.0	SSW	1.2	9.0
04:00 PM - 05:00 PM	0.7	155.0	SSE	0.6	66.0	ENE	0.3	116.0	ESE	0.5	217.0	SW	0.3	255.0
05:00 PM - 06:00 PM	0.3	69.0	ENE	0.8	109.0	ESE	0.6	252.0	WSW	1.3	47.0	NE	0.6	30.0
06:00 PM - 07:00 PM	0.3	249.0	WSW	0.6	123.0	ESE	0.5	254.0	WSW	1.9	81.0	E	0.9	229.0
07:00 PM - 08:00 PM	0.5	56.0	NE	0.5	83.0	E	0.3	96.0	E	1.7	231.0	SW	1.2	239.0
08:00 PM - 09:00 PM	2.4	218.0	SW	0.9	238.0	WSW	0.3	244.0	WSW	1.5	188.0	S	0.3	244.0
09:00 PM - 10:00 PM	1.3	17.0	NNE	5.3	37.0	NE	0.6	1.0	N	0.6	61.0	ENE	1.7	196.0
10:00 PM - 11:00 PM	0.6	248.0	WSW	2.1	107.0	ESE	1.3	0.0	N	1.2	151.0	SSE	1.3	183.0
11:00 PM - 12:00 AM	1.5	111.0	ESE	0.5	59.0	ENE	0.8	190.0	S	1.2	173.0	S	0.6	192.0
12:00 AM - 01:00 AM	3.4	173.0	S	1.2	197.0	SSW	1.4	43.0	NE	3.0	71.0	ENE	0.3	246.0
01:00 AM - 02:00 AM	0.3	85.0	E	1.6	9.0	N	0.8	122.0	ESE	0.9	20.0	NNE	0.9	6.0
02:00 AM - 03:00 AM	1.3	27.0	NNE	1.5	106.0	ESE	1.5	82.0	E	1.2	41.0	NE	1.3	35.0
03:00 AM - 04:00 AM	0.7	72.0	ENE	2.0	228.0	SW	0.3	241.0	WSW	2.3	204.0	SSW	0.6	147.0
04:00 AM - 05:00 AM	2.2	176.0	S	2.8	249.0	WSW	0.4	212.0	SSW	1.6	235.0	SW	0.5	229.0
05:00 AM - 06:00 AM	0.8	146.0	SE	0.6	16.0	NNE	1.2	46.0	NE	0.5	115.0	ESE	0.3	119.0
06:00 AM - 07:00 AM	1.6	243.0	WSW	1.8	130.0	SE	1.3	47.0	NE	0.3	9.0	N	0.3	9.0
07:00 AM - 08:00 AM	0.3	164.0	SSE	0.4	30.0	NNE	1.4	18.0	NNE	0.3	195.0	SSW	0.7	128.0
08:00 AM - 09:00 AM	0.5	171.0	S	0.5	185.0	S	1.6	68.0	ENE	0.3	54.0	NE	1.3	106.0
09:00 AM - 10:00 AM	0.6	87.0	E	1.4	129.0	SE	2.8	10.0	N	0.5	8.0	N	1.6	52.0

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Approved by

Sarayuth Jittrantont
Assistant General Manager

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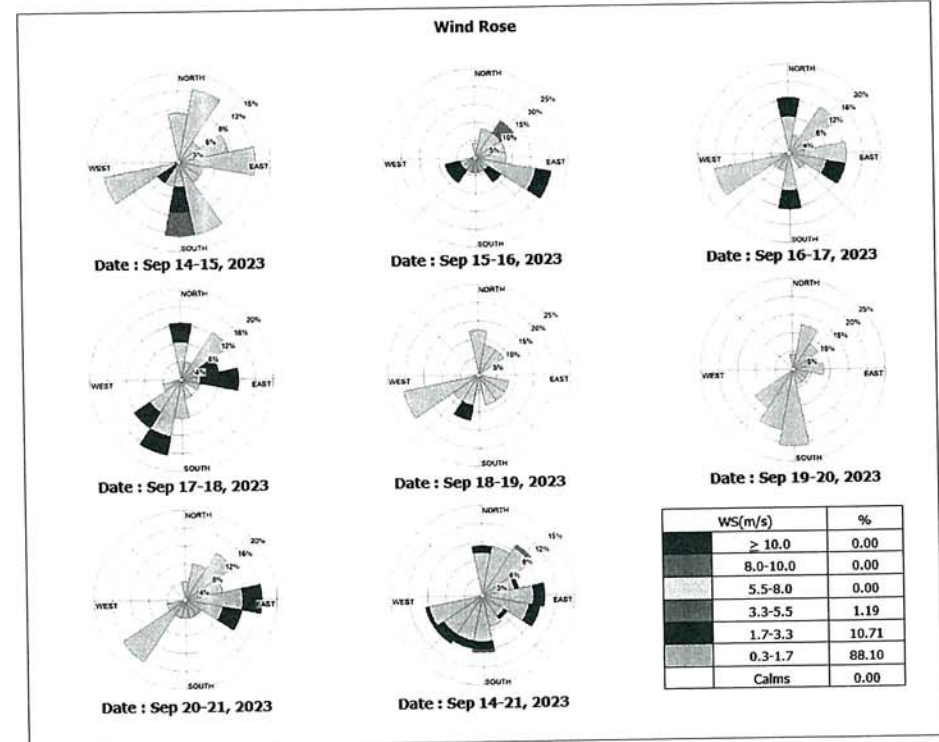


Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23106856
Date Received : Sep 26, 2023
Date Reported : Oct 03, 2023
Report Number : 2773590-1

Page 2 of 2



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Approved by

Sarayuth Jittrantont
Assistant General Manager

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ภาคผนวก ค-3

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 2374965

Date Received : Jul 05, 2023

Date Reported : Jul 13, 2023

Report Number : 2698939-1

Page 1 of 2

Sample Number	2374965-1
Sampled Date	Jul 05, 2023 10:40 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Jul 05, 2023
Condition of Sample	Contained in four glass vials, one amber glass bottle and three 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, 23rd ed., 2017, 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, 23rd ed., 2017, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	10	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	10	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	8.1	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	35.3	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	756	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
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, 23rd ed., 2017, part 2540 D	Rayong

Technical Management

N. Banchookit

Narumon Banchookit
Supervisor

โทร: 09-0999999 โทรสาร: 09-0999999

Approved by

D. Changchon

Dej Changchon
Senior Manager

โทร: 09-0999999 โทรสาร: 09-0999999

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6506-102/ ENH



Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 2374965

Date Received : Jul 05, 2023

Date Reported : Jul 13, 2023

Report Number : 2698939-1

Page 2 of 2

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 : Pathompong Kornasawat โทร: 09-0999999 โทรสาร: 09-0999999, Thanasoun Namakunna โทร: 09-0999999 โทรสาร: 09-0999999

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

Technical Management

N. Banchookit

Narumon Banchookit
Supervisor

โทร: 09-0999999 โทรสาร: 09-0999999

Approved by

D. Changchon

Dej Changchon
Senior Manager

โทร: 09-0999999 โทรสาร: 09-0999999

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6506-102/ ENH



Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009
Lot ID: 2374965
Date Received : Jul 05, 2023
Date Reported : Jul 13, 2023
Report Number : 2698939-2

Page 1 of 3

Sample Number 2374965-1
Sampled Date Jul 05, 2023 10:40 AM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Jul 08, 2023
Condition of Sample Contained in four glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,1,1-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,1,2-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,1-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,2-Dichloroethane *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,3-Dichloropropane *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Benzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Carbontetrachloride	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
cis-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Ethylbenzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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Approved by

Siriluk P.

Siriluk Puengpang
Section Head

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6506-102/ E/MS

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009
Lot ID: 2374965
Date Received : Jul 05, 2023
Date Reported : Jul 13, 2023
Report Number : 2698939-2

Page 2 of 3

Sample Number 2374965-1
Sampled Date Jul 05, 2023 10:40 AM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Jul 08, 2023
Condition of Sample Contained in four glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Hexachlorobutadiene *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Methyl Chloride *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Methylene Chloride (Dichloromethane)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Tetrachloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Toluene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Total Xylene	ug/L	1.5	5	<5	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
trans-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Trichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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Approved by

Siriluk P.

Siriluk Puengpang
Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009
Lot ID: 2374965
Date Received : Jul 05, 2023
Date Reported : Jul 13, 2023
Report Number : 2698939-2

Page 3 of 3

Sample Number	2374965-1
Sampled Date	Jul 05, 2023 10:40 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Jul 08, 2023
Condition of Sample	Contained in four glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	12.9	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5310 B	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 : Pathompong Kornswat , Thanasoun Namakunna

Remark :
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by

Siriluk P.

Siriluk Puengpang
Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0042
Lot ID: 2387805
Date Received : Aug 02, 2023
Date Reported : Aug 10, 2023
Report Number : 2729286-1

Page 1 of 2

Sample Number	2387805-1
Sampled Date	Aug 02, 2023 11:05 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Aug 02, 2023
Condition of Sample	Contained in four glass vials, two amber glass bottles and three 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, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	46	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	13	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	11	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, 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, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.7	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	636	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
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, 23rd ed., 2017, part 2540 D	Rayong

Technical Management

N. Banthit

Narumon Banchongkit
Supervisor
โทรศัพท์ ๖-๓๒๓-๙-๙๔๔๕

Approved by

D. Changchon

Dej Changchon
Senior Manager
โทรศัพท์ ๖-๓๒๓-๙-๙๔๔๕

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0042
Lot ID: 2387805
Date Received : Aug 02, 2023
Date Reported : Aug 10, 2023
Report Number : 2729286-1

Page 2 of 2

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 : Chainusorn Lertnathakunchai วัฒนธนาชัย วั-323-ฯ-9461, Pattarapol Sawangjaitam วัฒนธนาชัย วั-204-ฯ-0002

Remark :

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- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.



Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009
Lot ID: 2387805
Date Received : Aug 02, 2023
Date Reported : Aug 10, 2023
Report Number : 2729286-2

Page 1 of 3

Sample Number : 2387805-1
Sampled Date : Aug 02, 2023 11:05 AM
Sample Description : Wastewater
Location : AZ-1
Date Analysis Commenced : Aug 04, 2023
Condition of Sample : Contained in four glass vials, two amber glass bottles and three plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,1,1-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,1,2-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,1-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,2-Dichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,3-Dichloropropane *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Benzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Carbontetrachloride	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
cis-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Ethylbenzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

Technical Management

N. Banongkit

Narumon Banhongkit
Supervisor
โทร: 09-323-ฯ-9445

Approved by

D. Chanchon

Dej Chanchon
Senior Manager
โทร: 09-323-ฯ-9442

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Approved by

Suwimon C.

Suwimon Chairuangwut
Scientist (3)

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0009
Lot ID: 2387805
Date Received : Aug 02, 2023
Date Reported : Aug 10, 2023
Report Number : 2729286-2

Page 2 of 3

Sample Number	2387805-1
Sampled Date	Aug 02, 2023 11:05 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Aug 04, 2023
Condition of Sample	Contained in four glass vials, two amber glass bottles and three plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Hexachlorobutadiene *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Methyl Chloride	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Methylene Chloride (Dichloromethane)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Tetrachloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Toluene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Total Xylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
trans-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Trichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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Suwimon Chairuangwut
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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0009
Lot ID: 2387805
Date Received : Aug 02, 2023
Date Reported : Aug 10, 2023
Report Number : 2729286-2

Page 3 of 3

Sample Number	2387805-1
Sampled Date	Aug 02, 2023 11:05 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Aug 04, 2023
Condition of Sample	Contained in four glass vials, two amber glass bottles and three plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	13.3	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5310 B	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 : Chaiyusorn Lertnathakunchai , Pattarapol Sawangjaitam

Remark :
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Suwimon Chairuangwut
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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0042
Lot ID: 23101146
Date Received : Sep 06, 2023
Date Reported : Sep 14, 2023
Report Number : 2759390-1

Page 1 of 2

Sample Number 23101146-1
Sampled Date Sep 06, 2023 10:40 AM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Sep 06, 2023
Condition of Sample Contained in four glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)
Physical Property Colorless, some odour, solid and no turbid

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, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	37	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	11	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	10	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	8.2	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	35.6	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1000	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
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, 23rd ed., 2017, part 2540 D	Rayong

Technical Management

N. Banongkit

Narumon Banongkit
Supervisor
โทร: 03304-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager
โทร: 03304-9442

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0042
Lot ID: 23101146
Date Received : Sep 06, 2023
Date Reported : Sep 14, 2023
Report Number : 2759390-1

Page 2 of 2

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 : Wanlop Hunchainaw ทนดณดล 323-9457, Thanasoun Namakunna ทนดณดล 204-8592

Remark :

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Technical Management

N. Banongkit

Narumon Banongkit
Supervisor
โทร: 03304-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager
โทร: 03304-9442

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009

Lot ID: 23101146
Date Received : Sep 06, 2023
Date Reported : Sep 14, 2023
Report Number : 2759390-2

Page 1 of 3

Sample Number	23101146-1
Sampled Date	Sep 06, 2023 10:40 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Sep 07, 2023
Condition of Sample	Contained in four glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)
Physical Property	Colorless, some odour, solid and no turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,1,1-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,1,2-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,1-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,2-Dichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,3-Dichloropropane *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Benzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Carbontetrachloride	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
cis-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Ethylbenzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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Approved by

Siriluk P.

Siriluk Puengpang
Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009

Lot ID: 23101146
Date Received : Sep 06, 2023
Date Reported : Sep 14, 2023
Report Number : 2759390-2

Page 2 of 3

Sample Number	23101146-1
Sampled Date	Sep 06, 2023 10:40 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Sep 07, 2023
Condition of Sample	Contained in four glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)
Physical Property	Colorless, some odour, solid and no turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Hexachlorobutadiene *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Methyl Chloride *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Methylene Chloride (Dichloromethane)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Tetrachloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Toluene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Total Xylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
trans-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Trichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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Siriluk P.

Siriluk Puengpang
Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009
Lot ID: 23101146
Date Received : Sep 06, 2023
Date Reported : Sep 14, 2023
Report Number : 2759390-2

Page 3 of 3

Sample Number	23101146-1						
Sampled Date	Sep 06, 2023 10:40 AM						
Sample Description	Wastewater						
Location	AZ-1						
Date Analysis Commenced	Sep 07, 2023						
Condition of Sample	Contained in four glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Physical Property	Colorless, some odour, solid and no turbid						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	15.0	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5310 B	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 : Wanlop Hunchanaow , Thanasoun Namakunna

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

Approved by

Siriluk P.
Siriluk Puengpang
Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0042
Lot ID: 23111819
Date Received : Oct 04, 2023
Date Reported : Oct 12, 2023
Report Number : 2787426-1

Page 1 of 2

Sample Number	23111819-1						
Sampled Date	Oct 04, 2023 11:00 AM						
Sample Description	Wastewater						
Location	AZ-1						
Date Analysis Commenced	Oct 04, 2023						
Condition of Sample	Contained in four glass vials, two amber glass bottles and three 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, 23rd ed., 2017, 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, 23rd ed., 2017, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	7	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, 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, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	7.6	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	31.6	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	456	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
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, 23rd ed., 2017, part 2540 D	Rayong

Technical Management

N. Banongkit
Narumon Banchongkit
Supervisor
หมายเลขโทรศัพท์ ๖-323-๖-9445

Approved by

D. Changchon
Dej Changchon
Senior Manager
หมายเลขโทรศัพท์ ๖-323-๖-9442

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 23111819

Date Received : Oct 04, 2023

Date Reported : Oct 12, 2023

Report Number : 2787426-1

Page 2 of 2

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).

Note : Raw data of COD value (Refer to Lot ID 23111819-1) is 10.4 mg/L.

Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ 7-323-จ-9461, Pattarapol Sawangjaitam ทะเบียนเลขที่ 7-204-จ-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.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.



Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0009

Lot ID: 23111819

Date Received : Oct 04, 2023

Date Reported : Oct 11, 2023

Report Number : 2787426-2

Page 1 of 3

Sample Number	23111819-1						
Sampled Date	Oct 04, 2023 11:00 AM						
Sample Description	Wastewater						
Location	AZ-1						
Date Analysis Commenced	Oct 05, 2023						
Condition of Sample	Contained in four glass vials, two amber glass bottles and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,1,1-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,1,2-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,1-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,2-Dichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,3-Dichloropropane *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Benzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Carbontetrachloride	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
cis-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Ethylbenzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

Technical Management

N. Banphit

Narumon Banchongkit

Supervisor

ทะเบียนเลขที่ 7-323-จ-9445

Approved by

D. Changchon

Dej Changchon

Senior Manager

ทะเบียนเลขที่ 7-323-ก-9442

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Siriluk Puengpang

Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009
Lot ID: 23111819
Date Received : Oct 04, 2023
Date Reported : Oct 11, 2023
Report Number : 2787426-2

Page 2 of 3

Sample Number 23111819-1
Sampled Date Oct 04, 2023 11:00 AM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Oct 05, 2023
Condition of Sample Contained in four glass vials, two amber glass bottles and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Hexachlorobutadiene *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Methyl Chloride *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Methylene Chloride (Dichloromethane)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Tetrachloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Toluene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Total Xylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
trans-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Trichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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Siriluk Puengpang
Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009
Lot ID: 23111819
Date Received : Oct 04, 2023
Date Reported : Oct 11, 2023
Report Number : 2787426-2

Page 3 of 3

Sample Number 23111819-1
Sampled Date Oct 04, 2023 11:00 AM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Oct 05, 2023
Condition of Sample Contained in four glass vials, two amber glass bottles and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	8.12	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5310 B	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 : Chainusorn Lertnanthakunchai , Pattarapol Sawangjaitam

Remark :

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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0042
Lot ID: 23125164
Date Received : Nov 01, 2023
Date Reported : Nov 09, 2023
Report Number : 2817737-1

Page 1 of 2

Sample Number	23125164-1						
Sampled Date	Nov 01, 2023 11:25 AM						
Sample Description	Wastewater						
Location	AZ-1						
Date Analysis Commenced	Nov 01, 2023						
Condition of Sample	Contained in one amber glass bottle, four glass vials and three 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, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	41	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	8	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, 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, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, 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, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.4	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	816	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
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, 23rd ed., 2017, part 2540 D	Rayong

Technical Management

N. Banchookit

Narumon Banchookit
Supervisor
โทรศัพท์ ๖-๓๒๓-๙-๙๔๔๕

Approved by

D. Chongchon

Dej Changchon
Senior Manager
โทรศัพท์ ๖-๓๒๓-๙-๙๔๔๕

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0042
Lot ID: 23125164
Date Received : Nov 01, 2023
Date Reported : Nov 09, 2023
Report Number : 2817737-1

Page 2 of 2

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 : Sansoen Khuiyoksu โทรศัพท์ ๖-๓๒๓-๙-๐๐๐๕, Thanasoun Namakunna โทรศัพท์ ๖-๒๐๔-๙-๘๕๙๒

Remark :

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- "c" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

N. Banchookit

Narumon Banchookit
Supervisor
โทรศัพท์ ๖-๓๒๓-๙-๙๔๔๕

Approved by

D. Chongchon

Dej Changchon
Senior Manager
โทรศัพท์ ๖-๓๒๓-๙-๙๔๔๕

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Water Testing

Project Location : Map Ta Phut_EBSM (SSMC)



TESTING

No.0009

Lot ID: 23125164

Date Received : Nov 01, 2023

Date Reported : Nov 09, 2023

Report Number : 2817737-2

Page 1 of 3

Sample Number	23125164-1
Sampled Date	Nov 01, 2023 11:25 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Nov 02, 2023
Condition of Sample	Contained in one amber glass bottle, four glass vials and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,1,1-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,1,2-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,1-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,2-Dichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,3-Dichloropropane *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Benzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Carbon tetrachloride	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
cis-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Ethylbenzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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Siriluk Puengpang
Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Water Testing

Project Location : Map Ta Phut_EBSM (SSMC)



TESTING

No.0009

Lot ID: 23125164

Date Received : Nov 01, 2023

Date Reported : Nov 09, 2023

Report Number : 2817737-2

Page 2 of 3

Sample Number	23125164-1
Sampled Date	Nov 01, 2023 11:25 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Nov 02, 2023
Condition of Sample	Contained in one amber glass bottle, four glass vials and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Hexachlorobutadiene *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Methyl Chloride *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Methylene Chloride (Dichloromethane)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Tetrachloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Toluene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Total Xylene	ug/L	1.5	5	<5	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
trans-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Trichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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Siriluk P.

Siriluk Puengpang
Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Water Testing

Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009

Lot ID: 23125164

Date Received : Nov 01, 2023

Date Reported : Nov 09, 2023

Report Number : 2817737-2

Page 3 of 3

Sample Number	23125164-1
Sampled Date	Nov 01, 2023 11:25 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Nov 02, 2023
Condition of Sample	Contained in one amber glass bottle, four glass vials and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	12.9	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5310 B	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 : Sansoen Khuiyoksui , Thanasoun Namakunna

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

Approved by

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Siriluk Puengpang
Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Water Testing

Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 23136098

Date Received : Dec 06, 2023

Date Reported : Dec 14, 2023

Report Number : 2842935-1

Page 1 of 2

Sample Number	23136098-1
Sampled Date	Dec 06, 2023 10:35 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Dec 06, 2023
Condition of Sample	Contained in two glass vials, two amber glass bottles and three 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, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	40	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	13	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	11	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, 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, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	34.0	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1020	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
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, 23rd ed., 2017, part 2540 D	Rayong

Technical Management

N. Banphit

Narumon Banchongkit
Supervisor

หมายเลข 7-323-9-9445

Approved by

D. Chongchon

Dej Chongchon
Senior Manager

หมายเลข 7-323-9-9442

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, 1-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0042
Lot ID: 23136098
Date Received : Dec 06, 2023
Date Reported : Dec 14, 2023
Report Number : 2842935-1

Page 2 of 2

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 : Sansoen Khuiyokul โทร: 323-4-0005, Thanasoun Namakunna โทร: 204-4-8592

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



Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, 1-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009
Lot ID: 23136098
Date Received : Dec 06, 2023
Date Reported : Dec 13, 2023
Report Number : 2842935-2

Page 1 of 3

Sample Number 23136098-1
Sampled Date Dec 06, 2023 10:35 AM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Dec 07, 2023
Condition of Sample Contained in two glass vials, two amber glass bottles and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,1,1-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,1,2-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,1-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,2-Dichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
1,3-Dichloropropane *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Benzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Carbontetrachloride	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
cis-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Ethylbenzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

Technical Management

N. Banthit

Narumon Banthongkit
Supervisor
โทร: 323-4-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager
โทร: 323-4-9442

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Siriluk Puengpang
Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009
Lot ID: 23136098
Date Received : Dec 06, 2023
Date Reported : Dec 13, 2023
Report Number : 2842935-2

Page 2 of 3

Sample Number 23136098-1
Sampled Date Dec 06, 2023 10:35 AM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Dec 07, 2023
Condition of Sample Contained in two glass vials, two amber glass bottles and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Hexachlorobutadiene *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Methyl Chloride *	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Methylene Chloride (Dichloromethane)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Tetrachloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Toluene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Total Xylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
trans-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Trichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009
Lot ID: 23136098
Date Received : Dec 06, 2023
Date Reported : Dec 13, 2023
Report Number : 2842935-2

Page 3 of 3

Sample Number 23136098-1
Sampled Date Dec 06, 2023 10:35 AM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Dec 07, 2023
Condition of Sample Contained in two glass vials, two amber glass bottles and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	13.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5310 B	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 : Sansoen Khuyoksuai , Thanasoun Namakunna

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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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4503142326
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 2374966
Date Received : Jul 05, 2023
Date Reported : Jan 11, 2024
Report Number: 2698945-1 C6

Page 1 of 2

Sample Number	2374966-1						
Sampling Date	Jul 05, 2023 10:55 AM						
Sample Description	Wastewater						
Location	Outfall						
Date Analysis Commenced	Jul 05, 2023						
Condition of Sample	Contained in six glass vials, two amber glass bottles and seven 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, 23rd ed., 2017, 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, 23rd ed., 2017, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	12	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	12	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	8.2	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	34.5	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	780	≤3000	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
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, 23rd ed., 2017, part 2540 D	Rayong

Technical Management

N. Banngkit

Narumon Banngkit
Supervisor
โทรศัพท์ ๖-323-๙-๙๔๔5

Approved by

D. Changchon

Dej Changchon
Senior Manager
โทรศัพท์ ๖-323-๙-๙๔๔2

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4503142326
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 2374966
Date Received : Jul 05, 2023
Date Reported : Jan 11, 2024
Report Number: 2698945-1 C6

Page 2 of 2

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: Pathompong Kornawat, Thanasoun Namakunna

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.

Technical Management

N. Banngkit

Narumon Banngkit
Supervisor
โทรศัพท์ ๖-323-๙-๙๔๔5

Approved by

D. Changchon

Dej Changchon
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โทรศัพท์ ๖-323-๙-๙๔๔2

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Analysis / Test Report

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8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4503142326
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0009

Lot ID: 2374966
Date Received : Jul 05, 2023
Date Reported : Jan 11, 2024
Report Number: 2698945-3 C6

Page 1 of 1

Sample Number	2374966-1						
Sampling Date	Jul 05, 2023 10:55 AM						
Sample Description	Wastewater						
Location	Outfall						
Date Analysis Commenced	Jul 06, 2023						
Condition of Sample	Contained in six glass vials, two amber glass bottles and seven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Benzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	12.5	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5310 B	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 : Pathompong Kornawat, Thanasoun Namakunna

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.

Approved by

Chanatt L.

Chanattagarn Imchom
Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4503142326
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 2387806
Date Received : Aug 02, 2023
Date Reported : Aug 11, 2023
Report Number: 2729290-1 C6

Page 1 of 2

Sample Number	2387806-1						
Sampling Date	Aug 02, 2023 10:58 AM						
Sample Description	Wastewater						
Location	Outfall						
Date Analysis Commenced	Aug 02, 2023						
Condition of Sample	Contained in six glass vials, two amber glass bottles and seven 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, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	36	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	12	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	13	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, 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, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.0	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	552	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
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, 23rd ed., 2017, part 2540 D	Rayong

Technical Management

N. Banphit

Narumon Banchongkit
Supervisor
โทรศัพท์มือถือ ๖-323-๙-๙445

Approved by

D. Chumou

Dej Changchon
Senior Manager
โทรศัพท์มือถือ ๖-323-๙-9442

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P/O : 4503142326
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0042
Lot ID: 2387806
Date Received : Aug 02, 2023
Date Reported : Aug 11, 2023
Report Number : 2729290-1 C6

Page 2 of 2

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 : Chainusorn Lertnanthakunchai, Pattarapol Sawangjaitam

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

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4503142326
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0009
Lot ID: 2387806
Date Received : Aug 02, 2023
Date Reported : Aug 11, 2023
Report Number : 2729290-3 C6

Page 1 of 1

Sample Number 2387806-1
Sampling Date Aug 02, 2023 10:58 AM
Sample Description Wastewater
Location Outfall
Date Analysis Commenced Aug 04, 2023
Condition of Sample Contained in six glass vials, two amber glass bottles and seven plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Benzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	12.3	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5310 B	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 : Chainusorn Lertnanthakunchai, Pattarapol Sawangjaitam

Remark :
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- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.

Technical Management

N. Banphit

Narumon Banchongkit
Supervisor
โทรศัพท์ ๖-323-๙-๙๔๕

Approved by

D. Changchon

Dej Changchon
Senior Manager
โทรศัพท์ ๖-323-๙-๙๔๕

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Approved by

Siriluk P.

Siriluk Puenggang
Section Head

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Analysis / Test Report

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8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4503142326
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 23101147
Date Received : Sep 06, 2023
Date Reported : Sep 18, 2023
Report Number : 2759393-1 C6

Page 1 of 2

Sample Number	23101147-1						
Sampling Date	Sep 06, 2023 10:25 AM						
Sample Description	Wastewater						
Location	Outfall						
Date Analysis Commenced	Sep 06, 2023						
Condition of Sample	Contained in one BOD bottle, six glass vials, three amber glass bottles and eight plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Physical Property	Yellow, some odour, solid and no turbid						
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, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	37	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	13	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	10	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	8.1	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.3	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	876	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
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, 23rd ed., 2017, part 2540 D	Rayong

Technical Management

N. Banphit

Narumon Banchongkit
Supervisor
โทรศัพท์ 0-323-9-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager
โทรศัพท์ 0-323-9-9442

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P/O : 4503142326
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 23101147
Date Received : Sep 06, 2023
Date Reported : Sep 18, 2023
Report Number : 2759393-1 C6

Page 2 of 2

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 : Wanlop Hunchainaw โทรศัพท์ 0-323-9-9457, Thanasoun Namakunna โทรศัพท์ 0-204-9-8592

Remark :

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- "c" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Technical Management

N. Banphit

Narumon Banchongkit
Supervisor
โทรศัพท์ 0-323-9-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager
โทรศัพท์ 0-323-9-9442

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P/O : 4503142326
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009

Lot ID: 23101147
Date Received : Sep 06, 2023
Date Reported : Sep 18, 2023
Report Number : 2759393-3 C6

Page 1 of 1

Sample Number	23101147-1						
Sampling Date	Sep 06, 2023 10:25 AM						
Sample Description	Wastewater						
Location	Outfall						
Date Analysis Commenced	Sep 07, 2023						
Condition of Sample	Contained in one BOD bottle, six glass vials, three amber glass bottles and eight plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Physical Property	Yellow, some odour, solid and no turbid						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Benzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	12.7	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5310 B	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 : Wanlop Hunchainawong, Thanasoun Namakunna

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.

Approved by

Sawitree N.
Sawitree Noisanglam
Manager

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P/O : 4503142326
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 23111853
Date Received : Oct 04, 2023
Date Reported : Oct 24, 2023
Report Number : 2787450-1 C6

Page 1 of 2

Sample Number	23111853-1						
Sampling Date	Oct 04, 2023 10:47 AM						
Sample Description	Wastewater						
Location	Outfall						
Date Analysis Commenced	Oct 04, 2023						
Condition of Sample	Contained in six glass vials, two amber glass bottles and seven 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, 23rd ed., 2017, 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, 23rd ed., 2017, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	10	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	8	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *	-	-	-	7.5	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	29.3	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	216	≤3000	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
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, 23rd ed., 2017, part 2540 D	Rayong

Technical Management

N. Banchookit
Narumon Banchookit
Supervisor
โทรศัพท์ ๖-323-๙-๙๔๔๕

Approved by

D. Changchon
Dej Changchon
Senior Manager
โทรศัพท์ ๖-323-๙-๙๔๔๕

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4503142326

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 23111853

Date Received : Oct 04, 2023

Date Reported : Oct 24, 2023

Report Number: 2787450-1 C6

Page 2 of 2

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).

Note : Raw data of COD value (Refer to Lot ID 23111853-1) is 20.48 mg/L.

Sampling By : Chainusorn Lertnanthakunchai

Remark :

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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4503142326

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0009

Lot ID: 23111853

Date Received : Oct 04, 2023

Date Reported : Oct 24, 2023

Report Number: 2787450-3 C6

Page 1 of 1

Sample Number	23111853-1						
Sampling Date	Oct 04, 2023 10:47 AM						
Sample Description	Wastewater						
Location	Outfall						
Date Analysis Commenced	Oct 05, 2023						
Condition of Sample	Contained in six glass vials, two amber glass bottles and seven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Benzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	3.44	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5310 B	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).

Note : Raw data of COD value (Refer to Lot ID 23111853-1) is 20.48 mg/L.

Sampling By : Chainusorn Lertnanthakunchai

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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6506-102/EMAIL

Technical Management

N. Banongkit

Narumon Banchongkit
Supervisor
โทรศัพท์ 0-323-9-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager
โทรศัพท์ 0-323-9-9442

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4503142326
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 23125166
Date Received : Nov 01, 2023
Date Reported : Jan 03, 2024
Report Number : 2817750-1 C6

Page 1 of 2

Sample Number	23125166-1						
Sampling Date	Nov 01, 2023 11:15 AM						
Sample Description	Wastewater						
Location	Outfall						
Date Analysis Commenced	Nov 01, 2023						
Condition of Sample	Contained in one amber glass bottle, six glass vials and seven 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, 23rd ed., 2017, 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, 23rd ed., 2017, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	16	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	16	≤300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, 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, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	32.0	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	764	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
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, 23rd ed., 2017, part 2540 D	Rayong

Technical Management

N. Bangmit

Narumon Bangchokit
Supervisor
โทรศัพท์ 7-323-9-9445

Approved by

D. Chamon

Dej Changchon
Senior Manager
โทรศัพท์ 7-323-9-9442

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4503142326
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 23125166
Date Received : Nov 01, 2023
Date Reported : Jan 03, 2024
Report Number : 2817750-1 C6

Page 2 of 2

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 : Sansoen Khuiyoksul, Thanasoun Namakunna

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.

Technical Management

N. Bangmit

Narumon Bangchokit
Supervisor
โทรศัพท์ 7-323-9-9445

Approved by

D. Chamon

Dej Changchon
Senior Manager
โทรศัพท์ 7-323-9-9442

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4503142326
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0009

Lot ID: 23125166
Date Received : Nov 01, 2023
Date Reported : Jan 03, 2024
Report Number : 2817750-3 C6

Page 1 of 1

Sample Number	23125166-1						
Sampling Date	Nov 01, 2023 11:15 AM						
Sample Description	Wastewater						
Location	Outfall						
Date Analysis Commenced	Nov 02, 2023						
Condition of Sample	Contained in one amber glass bottle, six glass vials and seven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Benzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	9.89	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5310 B	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 : Sansoen Khuyoksul, Thanasoun Namakunna

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.

Approved by

Sawitree N.
Sawitree Noisangiam
Manager

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4503142326
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 23136102
Date Received : Dec 06, 2023
Date Reported : Jan 03, 2024
Report Number : 2842940-1 C6

Page 1 of 2

Sample Number	23136102-1						
Sampling Date	Dec 06, 2023 10:15 AM						
Sample Description	Wastewater						
Location	Outfall						
Date Analysis Commenced	Dec 06, 2023						
Condition of Sample	Contained in six glass vials, two amber glass bottles and seven 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, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	31	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	12	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	10	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *	-	-	-	7.8	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	30.4	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	844	≤3000	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
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, 23rd ed., 2017, part 2540 D	Rayong

Technical Management

N. Banphit
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ 3-323-4-9445

Approved by

D. Chanchon
Dej Chanchon
Senior Manager
ทะเบียนเลขที่ 3-323-4-9442

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, 1-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4503142326
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0042

Lot ID: 23136102
Date Received : Dec 06, 2023
Date Reported : Jan 03, 2024
Report Number : 2842940-1 C6

Page 2 of 2

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 : Sansoen Khuiyoksul, Thanasoun Namakunna

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.



Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, 1-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4503142326
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009

Lot ID: 23136102
Date Received : Dec 06, 2023
Date Reported : Jan 03, 2024
Report Number : 2842940-3 C6

Page 1 of 1

Sample Number	23136102-1						
Sampling Date	Dec 06, 2023 10:15 AM						
Sample Description	Wastewater						
Location	Outfall						
Date Analysis Commenced	Dec 07, 2023						
Condition of Sample	Contained in six glass vials, two amber glass bottles and seven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
Benzene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	11.0	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5310 B	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 : Sansoen Khuiyoksul, Thanasoun Namakunna

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.

Technical Management

N. Banchongkit

Narumon Banchongkit
Supervisor

โทรศัพท์ 02-323-4-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager

โทรศัพท์ 02-323-4-9442

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Approved by

Chanatt L.

Chanattagam Imchom
Section Head

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ภาคผนวก ค-4

ระดับเสียงโดยทั่วไป



Analysis / Test Report



TESTING
No.0042

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2388457
Date Received : Aug 22, 2023
Date Reported : Aug 28, 2023
Report Number: 2756962-1

Page 1 of 1

Sample Number : 2388457-1
Parameter : Noise (Leq 24 hrs.)
Location : บริเวณรั้วโครงการฝั่งตะวันออก (GPS 47P 0734116, 1404381)
Measurement Date : Aug 16 - Aug 17, 2023
Measurement by : Saknarin Jaraskay
Sound Level meter : Serial No. 900073

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	67.5	75.9	67.1
11:00 AM - 12:00 PM	68.1	73.3	67.6
12:00 PM - 01:00 PM	67.2	74.8	66.8
01:00 PM - 02:00 PM	67.3	78.0	66.7
02:00 PM - 03:00 PM	67.4	76.3	66.9
03:00 PM - 04:00 PM	67.8	74.4	67.4
04:00 PM - 05:00 PM	67.8	75.8	67.3
05:00 PM - 06:00 PM	68.1	72.7	67.7
06:00 PM - 07:00 PM	68.1	73.7	67.7
07:00 PM - 08:00 PM	68.0	69.0	67.7
08:00 PM - 09:00 PM	67.4	68.7	67.0
09:00 PM - 10:00 PM	67.4	68.8	67.0
10:00 PM - 11:00 PM	67.8	69.1	67.4
11:00 PM - 12:00 AM	68.3	70.9	67.9
12:00 AM - 01:00 AM	68.0	69.6	67.7
01:00 AM - 02:00 AM	67.9	69.3	67.6
02:00 AM - 03:00 AM	67.9	69.5	67.5
03:00 AM - 04:00 AM	68.1	69.2	67.8
04:00 AM - 05:00 AM	67.7	69.0	67.4
05:00 AM - 06:00 AM	68.0	72.4	67.7
06:00 AM - 07:00 AM	68.0	69.0	67.7
07:00 AM - 08:00 AM	68.0	69.3	67.7
08:00 AM - 09:00 AM	68.3	71.9	67.9
09:00 AM - 10:00 AM	67.4	68.9	67.0

Leq Average 24 hrs. (dB(A)) : 67.8
Lmax (dB(A)) : 78.0
L90 (dB(A)) : 67.5
Ldn (dB(A)) : 74.3
Standard (dB(A)) : 70
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Thanita K.

Thanita Kulsuriwong
Scientist (4)

Approved by

Supot S.

Supot Salamteah
Section Head

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S:\Reports_Air Noise.rpt (9:09AM)



Analysis / Test Report



TESTING
No.0042

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2388457
Date Received : Aug 22, 2023
Date Reported : Aug 28, 2023
Report Number: 2756963-1

Page 1 of 1

Sample Number : 2388457-2
Parameter : Noise (Leq 24 hrs.)
Location : บริเวณรั้วโครงการฝั่งตะวันออก (GPS 47P 0734116, 1404381)
Measurement Date : Aug 17 - Aug 18, 2023
Measurement by : Saknarin Jaraskay
Sound Level meter : Serial No. 900073

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	67.1	68.5	66.7
11:00 AM - 12:00 PM	67.7	81.1	67.2
12:00 PM - 01:00 PM	67.8	70.0	67.4
01:00 PM - 02:00 PM	67.8	73.6	67.5
02:00 PM - 03:00 PM	67.8	71.6	67.4
03:00 PM - 04:00 PM	67.8	75.5	67.4
04:00 PM - 05:00 PM	67.7	73.9	67.3
05:00 PM - 06:00 PM	68.1	70.9	67.6
06:00 PM - 07:00 PM	68.0	71.4	67.6
07:00 PM - 08:00 PM	68.1	69.4	67.8
08:00 PM - 09:00 PM	68.1	69.4	67.7
09:00 PM - 10:00 PM	67.7	69.2	67.4
10:00 PM - 11:00 PM	67.4	68.9	66.9
11:00 PM - 12:00 AM	67.5	69.0	67.1
12:00 AM - 01:00 AM	67.6	68.9	67.2
01:00 AM - 02:00 AM	68.0	69.2	67.6
02:00 AM - 03:00 AM	67.5	69.1	67.1
03:00 AM - 04:00 AM	67.9	69.4	67.7
04:00 AM - 05:00 AM	67.7	68.9	67.4
05:00 AM - 06:00 AM	68.1	70.4	67.7
06:00 AM - 07:00 AM	68.0	69.9	67.6
07:00 AM - 08:00 AM	68.3	69.7	68.0
08:00 AM - 09:00 AM	67.8	69.7	67.4
09:00 AM - 10:00 AM	67.5	69.7	67.1

Leq Average 24 hrs. (dB(A)) : 67.8
Lmax (dB(A)) : 81.1
L90 (dB(A)) : 67.4
Ldn (dB(A)) : 74.2
Standard (dB(A)) : 70
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Thanita K.

Thanita Kulsuriwong
Scientist (4)

Approved by

Supot S.

Supot Salamteah
Section Head

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S:\Reports_Air Noise.rpt (9:09AM)



Analysis / Test Report



TESTING
No.0042

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2388457

Date Received : Aug 22, 2023

Date Reported : Aug 28, 2023

Report Number: 2756964-1

Page 1 of 1

Sample Number 2388457-3
Parameter Noise (Leq 24 hrs.)
Location บริเวณรั้วโครงการฝั่งตะวันออก (GPS 47P 0734116, 1404381)
Measurement Date Aug 18 - Aug 19, 2023
Measurement by Saknarin Jaraskay
Sound Level meter Serial No. 900073

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	66.9	68.4	66.5
11:00 AM - 12:00 PM	66.9	70.0	66.5
12:00 PM - 01:00 PM	66.7	71.8	66.2
01:00 PM - 02:00 PM	67.3	79.1	66.9
02:00 PM - 03:00 PM	67.3	87.6	66.6
03:00 PM - 04:00 PM	67.4	78.9	66.8
04:00 PM - 05:00 PM	67.9	72.9	67.3
05:00 PM - 06:00 PM	68.0	72.7	67.5
06:00 PM - 07:00 PM	67.5	75.8	67.0
07:00 PM - 08:00 PM	68.0	73.2	67.5
08:00 PM - 09:00 PM	67.2	74.7	66.7
09:00 PM - 10:00 PM	67.2	77.9	66.6
10:00 PM - 11:00 PM	67.3	76.2	66.7
11:00 PM - 12:00 AM	67.7	74.3	67.3
12:00 AM - 01:00 AM	67.8	75.7	67.2
01:00 AM - 02:00 AM	67.9	72.6	67.5
02:00 AM - 03:00 AM	68.1	73.6	67.7
03:00 AM - 04:00 AM	67.9	68.9	67.6
04:00 AM - 05:00 AM	67.3	68.6	67.0
05:00 AM - 06:00 AM	67.2	68.7	66.9
06:00 AM - 07:00 AM	67.7	69.0	67.3
07:00 AM - 08:00 AM	68.2	70.8	67.8
08:00 AM - 09:00 AM	67.9	69.5	67.6
09:00 AM - 10:00 AM	67.8	69.2	67.5

Leq Average 24 hrs. (dB(A)) 67.6
Lmax (dB(A)) 87.6
L90 (dB(A)) 67.0
Ldn (dB(A)) 74.0
Standard (dB(A)) 70 115

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

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

Technical Management

Thanita K.

Thanita Kulsuriwong
Scientist (4)

Approved by

Supot S.

Supot Salamteh
Section Head

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ภาคผนวก ค-5

ระดับเสียงในสถานประกอบการ



Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2388456

Date Received : Aug 18, 2023

Date Reported : Aug 24, 2023

Report Number: 2750973-1

Page 1 of 1

Sample Number 2388456-1
Parameter Noise (Leq 8 hrs.)
Location AT-3
Measurement Date Aug 16, 2023
Measurement by Saknarin Jaraskay

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:15 AM - 10:15 AM	79.5	80.8	79.3
10:15 AM - 11:15 AM	79.5	80.8	79.3
11:15 AM - 12:15 PM	79.5	80.8	79.3
12:15 PM - 01:15 PM	79.5	80.9	79.3
01:15 PM - 02:15 PM	79.5	80.9	79.3
02:15 PM - 03:15 PM	79.5	82.9	79.3
03:15 PM - 04:15 PM	79.5	80.9	79.3
04:15 PM - 05:15 PM	79.6	81.0	79.4

Leq Average 8 hrs. (dB(A))

79.5

Lmax (dB(A))

82.9

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย
ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๔๖



Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150

P/O : 4514155377

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2388456

Date Received : Aug 18, 2023

Date Reported : Aug 24, 2023

Report Number: 2750974-1

Page 1 of 1

Sample Number 2388456-2
Parameter Noise (Leq 8 hrs.)
Location FT-2
Measurement Date Aug 16, 2023
Measurement by Saknarin Jaraskay

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:26 AM - 10:26 AM	80.2	85.2	79.1
10:26 AM - 11:26 AM	79.7	83.4	78.5
11:26 AM - 12:26 PM	79.8	83.2	78.7
12:26 PM - 01:26 PM	80.1	84.1	79.0
01:26 PM - 02:26 PM	80.1	83.9	79.1
02:26 PM - 03:26 PM	80.0	83.5	78.7
03:26 PM - 04:26 PM	80.0	84.3	78.6
04:26 PM - 05:26 PM	79.3	83.7	78.1

Leq Average 8 hrs. (dB(A))

79.9

Lmax (dB(A))

85.2

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย
ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๔๖

Technical Management

Thanita K.

Thanita Kulsuriwong
Scientist (4)

Approved by

Supot S.

Supot Salamteh
Section Head

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S:\Reports_Air Noise.rpt (10:38AM)

Technical Management

Thanita K.

Thanita Kulsuriwong
Scientist (4)

Approved by

Supot S.

Supot Salamteh
Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23113321
Date Received : Nov 15, 2023
Date Reported : Nov 20, 2023
Report Number: 2841400-1

Page 1 of 1

Sample Number	23113321-1
Parameter	Noise (Leq 8 hrs.)
Location	AT-3
Measurement Date	Nov 14, 2023
Measurement by	Sawai Tonpho

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:52 AM - 09:52 AM	78.4	82.7	78.1
09:52 AM - 10:52 AM	78.3	80.3	78.1
10:52 AM - 11:52 AM	78.2	79.4	77.9
11:52 AM - 12:52 PM	78.1	79.3	77.9
12:52 PM - 01:52 PM	78.2	80.8	77.9
01:52 PM - 02:52 PM	78.1	79.4	77.9
02:52 PM - 03:52 PM	78.2	79.1	78.1
03:52 PM - 04:52 PM	78.2	78.8	78.0
Leq Average 8 hrs. (dB(A))	78.2		
Lmax (dB(A))		82.7	
Standard (dB(A))	90	140	

Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัยในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๖๖

Technical Management

Thanita K.

Thanita Kulsuriwong
Scientist (4)

Approved by

Supot S.

Supot Salamteh
Section Head

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand 21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23113321
Date Received : Nov 15, 2023
Date Reported : Nov 20, 2023
Report Number: 2841401-1

Page 1 of 1

Sample Number	23113321-2
Parameter	Noise (Leq 8 hrs.)
Location	FT-2
Measurement Date	Nov 14, 2023
Measurement by	Sawai Tonpho

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:44 AM - 09:44 AM	80.1	87.3	78.6
09:44 AM - 10:44 AM	79.9	86.0	78.5
10:44 AM - 11:44 AM	79.8	87.4	78.4
11:44 AM - 12:44 PM	79.7	85.9	78.3
12:44 PM - 01:44 PM	79.9	87.8	78.1
01:44 PM - 02:44 PM	79.4	85.5	78.2
02:44 PM - 03:44 PM	79.8	87.6	78.5
03:44 PM - 04:44 PM	79.8	85.6	78.6
Leq Average 8 hrs. (dB(A))	79.8		
Lmax (dB(A))		87.8	
Standard (dB(A))	90	140	

Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัยในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๖๖

Technical Management

Thanita K.

Thanita Kulsuriwong
Scientist (4)

Approved by

Supot S.

Supot Salamteh
Section Head

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ภาคผนวก ค-6

คุณภาพอากาศในสถานประกอบการ



Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand
21150

P/O : 4514155377

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009

Lot ID: 2388455

Date Received : Aug 18, 2023

Date Reported : Aug 26, 2023

Report Number : 2730977-1

Sample Number 2388455-1
Sampled Date Aug 16, 2023
Sample Description Air Quality
Location FT-3/CT-3
Date Analysis Commenced Aug 22, 2023
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 757 mmHg
Atmospheric Temperature 32.0 °C

Page 1 of 3

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Styrene	09:30 AM - 11:30 AM	ppm	-	0.05	<0.05	100	Based on NIOSH (2003), 1501	MOL	Bangkok

Guideline :

MOL : 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 : Saknarin Jaraskay

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

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.

8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand
21150

P/O : 4514155377

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009

Lot ID: 2388455

Date Received : Aug 18, 2023

Date Reported : Aug 26, 2023

Report Number : 2730977-1

Sample Number 2388455-2
Sampled Date Aug 16, 2023
Sample Description Air Quality
Location AT-3
Date Analysis Commenced Aug 22, 2023
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 757 mmHg
Atmospheric Temperature 32.0 °C

Page 2 of 3

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Benzene	09:15 AM - 11:15 AM	ppm	-	0.06	<0.06	1	Based on NIOSH (2003), 1501	MOL	Bangkok

Guideline :

MOL : 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 : Saknarin Jaraskay

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand
21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)



TESTING
No.0009

Lot ID: 2388455
Date Received : Aug 18, 2023
Date Reported : Aug 26, 2023
Report Number : 2730977-1

Page 3 of 3

Sample Number 2388455-3
Sampled Date Aug 16, 2023
Sample Description Air Quality
Location AT-4/AT-5
Date Analysis Commenced Aug 22, 2023
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 757 mmHg
Atmospheric Temperature 32.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Ethylbenzene *	09:10 AM - 11:10 AM	ppm	-	0.05	<0.05	100	Based on NIOSH (2003), 1501	MOL	Bangkok

Guideline :

MOL : 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 : Saknarin Jaraskay

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

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand
21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23113318
Date Received : Nov 15, 2023
Date Reported : Nov 23, 2023
Report Number : 2789832-1

Page 1 of 3

Sample Number 23113318-1
Sampled Date Nov 14, 2023
Sample Description Air Quality
Location FT-3/CT-3
Date Analysis Commenced Nov 16, 2023
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 758 mmHg
Atmospheric Temperature 32.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Styrene	09:30 AM - 11:30 AM	ppm	-	0.05	<0.05	100	Based on NIOSH (2003), 1501	MOL	Bangkok

Guideline :

MOL : 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 : Natthapon Jhengwareewong

Remark :

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

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand
21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23113318
Date Received : Nov 15, 2023
Date Reported : Nov 23, 2023
Report Number : 2789832-1

Page 2 of 3

Sample Number	23113318-2
Sampled Date	Nov 14, 2023
Sample Description	Air Quality
Location	AT-3
Date Analysis Commenced	Nov 16, 2023
Condition of Sample	Drawn into one sorbent tube, refrigerated
Barometric Pressure	758 mmHg
Atmospheric Temperature	32.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Benzene	09:30 AM - 11:30 AM	ppm	-	0.06	<0.06	1	Based on NIOSH (2003), 1501	MOL	Bangkok

Guideline :

MOL : 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 : Natthapon Jiengwareewong

Remark :

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

Approved by

Orawan R.

Orawan Rak Yong
Scientist (3)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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Analysis / Test Report

Client : Siam Styrene Monomer Co., Ltd.
8, I-4 Road, Map Ta Phut Industrial Estate, Maptaphut, Muang, Rayong Thailand
21150
P/O : 4514155377
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 23113318
Date Received : Nov 15, 2023
Date Reported : Nov 23, 2023
Report Number : 2789832-1

Page 3 of 3

Sample Number	23113318-3
Sampled Date	Nov 14, 2023
Sample Description	Air Quality
Location	AT-4/AT-5
Date Analysis Commenced	Nov 16, 2023
Condition of Sample	Drawn into one sorbent tube, refrigerated
Barometric Pressure	758 mmHg
Atmospheric Temperature	32.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Ethylbenzene	09:30 AM - 11:30 AM	ppm	-	0.05	<0.05	100	Based on NIOSH (2003), 1501	MOL	Bangkok

Guideline :

MOL : 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 : Natthapon Jiengwareewong

Remark :

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

Approved by

Orawan R.

Orawan Rak Yong
Scientist (3)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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ภาคผนวก ง

ใบรับรองการสอบเทียบเครื่องมือ



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รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Stack	Total Suspended Particulate	Console Control Unit	BKK_FS0468	13-Jul-23	13-Jan-24	6
Stack	Total Suspended Particulate	Console Control Unit	BKK_FS0518	13-Jul-23	13-Jan-24	6
Stack	Total Suspended Particulate	Digital Balance	RYG_EN0003	1-Mar-23	1-Mar-24	12
Stack	Total Hydrocarbon as Propane	Console Control Unit	BKK_FS0468	13-Jul-23	13-Jan-24	6
Stack	Total Hydrocarbon as Propane	Console Control Unit	BKK_FS0518	13-Jul-23	13-Jan-24	6
Stack	Total Hydrocarbon as Propane	Total Hydrocarbon Analyzer	RYG_EN0038	25-Jan-23	25-Jan-24	12
Stack	Total Hydrocarbon as Propane	FID Analyzer	BKK_FS0758	1-Jul-23	1-Jan-24	6
Stack (CEMs)	Oxides of Nitrogen	Analyzer , System calibration, Star	-	-	-	-
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0186	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0665	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	Digital Balance	RYG_EN0001	1-Mar-23	1-Mar-24	12
Ambient	Total Suspended Particulate	High Volume	RYG_FS0664	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_EN0292	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	RYG_EN0001	1-Mar-23	1-Mar-24	12
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0261	1-Jul-23	1-Jan-24	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0551	1-Jul-23	1-Jan-24	6
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0089	19-Jan-23	19-Jul-24	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0085	19-Jun-23	19-Dec-24	18
Noise	Leq 24 hrs	Sound Calibrator	RYG_FS0496	17-Jan-23	17-Jan-24	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0494	13-Jan-23	13-Jan-24	12
Noise	Leq 8 hrs	Sound Calibrator	RYG_FS0496	17-Jan-23	17-Jan-24	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0612	12-Oct-22	12-Oct-23	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0614	12-Oct-22	12-Oct-23	12
Noise	Leq 8 hrs	Sound Calibrator	RYG_FS0213	26-Jan-23	26-Jan-24	12
Noise	Leq 8 hrs	Sound Level Meter	NKH_FS0115	1-Nov-23	1-Nov-24	12
Noise	Leq 8 hrs	Sound Level Meter	NKH_FS0114	1-Nov-23	1-Nov-24	12
Workplace	Benzene	Field Rotameter	BKK_FS1006	1-Jul-23	1-Oct-23	3
Workplace	Benzene	Field Rotameter	BKK_FS1006	2-Oct-23	2-Jan-24	3
Workplace	Benzene	GC-MSD	BKK_EN0119	18-Apr-23	18-Oct-24	18
Workplace	Ethyl Benzene	Field Rotameter	BKK_FS1006	1-Jul-23	1-Oct-23	3
Workplace	Ethyl Benzene	Field Rotameter	BKK_FS1006	2-Oct-23	2-Jan-24	3
Workplace	Ethyl Benzene	GC-MSD	BKK_EN0119	18-Apr-23	18-Oct-24	18
Workplace	Styrene	Field Rotameter	BKK_FS1006	1-Jul-23	1-Oct-23	3
Workplace	Styrene	Field Rotameter	BKK_FS1006	2-Oct-23	2-Jan-24	3
Workplace	Styrene	GC-MSD	BKK_EN0119	18-Apr-23	18-Oct-24	18
Rayong Lab	Temperature	pH meter	RYG_FS0574	3-Apr-23	3-Apr-24	12
Rayong Lab	Total Dissolved Solids 180°C	Electronic Balance	RYG_EN0002	1-Mar-23	1-Mar-24	12
Rayong Lab	Total Dissolved Solids 180°C	Hot Air Oven	RYG_EN0010	20-Oct-22	20-Apr-24	18
Rayong Lab	Total Suspended Solids	Electronic Balance	RYG_EN0002	1-Mar-23	1-Mar-24	12
Rayong Lab	Total Suspended Solids	Hot Air Oven	RYG_EN0010	20-Oct-22	20-Apr-24	18
Rayong Lab	pH at 25 °C	pH meter	RYG_EN0183	27-Feb-23	27-Feb-24	12
Rayong Lab	Oil & Grease	Electronic Balance	RYG_EN0002	1-Mar-23	1-Mar-24	12
Rayong Lab	Oil & Grease	Hot Air Oven	RYG_EN0006	20-Oct-22	20-Apr-24	18
Rayong Lab	Oil & Grease	Water Bath	RYG_EN0061	20-Oct-22	20-Apr-24	18
Water Lab	Total Organic carbon	TOC Analyzer	BKK_EN0066	11-May-23	11-May-24	12
Rayong Lab	BOD	DO meter with Sensor	RYG_EN0032	24-Jul-23	24-Jan-25	18
Rayong Lab	BOD	Incubator	RYG_EN0154	29-May-23	29-Nov-24	18
Rayong Lab	COD	Spectrophotometer	RYG_EN0037	27-Sep-22	27-Mar-24	18

Type S Pitot Tube Coefficient Data					
	Type s pitot tube Leg A,B	Standard pitot tube (ΔP, mm.H ₂ O)	Type s pitot tube (ΔP, mm.H ₂ O)	Cp (s) Leg A	Cp (s) Leg B
Test 1	A	12.00	17.00	0.840	-
	B	12.00	17.00	-	0.840
Test 2	A	12.00	17.00	0.840	-
	B	12.00	17.00	-	0.840
Test 3	A	12.00	16.80	0.845	-
	B	12.00	16.80	-	0.845
			\bar{C}_p	0.842	0.842

$$Cp(s) = C_{P_{std}} \sqrt{\frac{\Delta P(s)}{\Delta P(s)}}$$

$$[\bar{C}_{p(A)} - \bar{C}_{p(B)}] \text{ must BE } \leq 0.01$$

$$\text{Average deviation(A or B)} = \frac{\sum [Cp(s) - Cp(A \text{ or } B)]}{3} \text{ must BE } \leq 0.01$$

Calibrated by Saksit Phaisanphiset
(Mr. Saksit Phaisanphiset)
Field Scientist (4)

Approved by Nattaporn Jengwareewong
(Mr.Nattaporn Jengwareewong)
Specialist (1)

CONSOLE CONTROL UNIT CALIBRATION TEST REPORT

Calibration of Date : 13-Jul-23
Next Cal. Date : 13-Jan-24

Console Control Meter Data

Calibration No. : C-130723-BKK_FS0468
Dry Gas Meter ID : BKK_FS0468
Serial No. : 1302005
Model No. : XC-572-V

Barometric Pressure (mmHg) : 751
Relative Humidity (%) : 60.0
Temperature (C°) : 29.0
Reference Dry Gas Meter Data
Reference Dry Gas Meter ID : BKK_FS1122
Serial No. : A2003240
Correction Factor (Y) : 1.0160
Next Calibration Date : 25-Nov-23

ΔH (mm.H ₂ O)	Θ Minutes	Reference Dry Gas Meter Calibration										Console Control : Drygas Meter										Dry Gas Meter		Office Calibration Factor ΔHΘ
		Vr (liters)			Tr (°C)	Vm (liters)			Tl (°C)	To (°C)	Avg.Tm (°C)	Correction Factor (Y)												
		Final	Initial	Total		Final	Initial	Total																
15	12.65	150.00	0.00	150.00	26.0	241330.0	241175.0	155.00	25.0	26.0	26.0	0.9818	48.8873											
25	9.90	150.00	0.00	150.00	26.0	241498.0	241343.0	155.00	26.0	26.0	26.0	0.9808	49.9039											
50	6.82	150.00	0.00	150.00	26.0	241659.0	241504.0	155.00	26.0	26.0	26.0	0.9784	47.9566											
100	4.82	150.00	0.00	150.00	26.0	241823.0	241669.0	154.00	26.0	26.0	26.0	0.9800	47.3171											
150	4.02	150.00	0.00	150.00	26.0	241998.0	241844.0	154.00	27.0	27.0	27.0	0.9785	49.2059											
Y	Ratio of reading of reference to dry gas meter : tolerance for individual values ± 0.02 from average.														Avg.	0.9799	48.5360							

Y : Ratio of reading of reference to dry gas meter : tolerance for individual values ± 0.02 from average.

ΔHΘ : Orifice pressure differential that equates to 21.24 in of air @ 25 C and 760 mm of mercury, mmH₂O : tolerance for individual values ± 5.08 from average.

Procedure: 40 CFR 60,APP A, METH, SEC 5.3 & 7
Calibrated by: Saksit Phaisanphiset
(Mr. Saksit Phaisanphiset)

Field Scientist(4)

Approved by: Nattaporn Jengwareewong
(Mr.Nattaporn Jengwareewong)

Field Specialist(1)





Pitot Tube Calibration Data

Pitot Tube Identification Number : BKK_FS0473 Calibration Date : 13 Jul 23
 Lab test duct Number : 258-1-13-01 Standard Pitot ID : BKK_FS0441
 Calibration Sheet No. : C-130723-BKK_FS0473 Cp Standard : 0.99

Type S Pitot Tube Coefficient Data					
	Type s pitot tube Leg A,B	Standard pitot tube (ΔP , mm.H ₂ O)	Type s pitot tube (ΔP , mm.H ₂ O)	Cp (s) Leg A	Cp (s) Leg B
Test 1	A	12.00	17.00	0.840	-
	B	12.00	17.00	-	0.840
Test 2	A	12.00	17.00	0.840	-
	B	12.00	17.00	-	0.840
Test 3	A	12.00	16.80	0.845	-
	B	12.00	16.80	-	0.845
\bar{C}_p				0.842	0.842

$$C_p(S) = C_p \sqrt{\frac{\Delta P(std)}{\Delta P (s)}}$$

$$| \bar{C}_p(A) - \bar{C}_p(B) | \text{ must BE } \leq 0.01$$

$$\text{Average deviation(A or B)} = \frac{\sum [C_p(s) - C_p(A \text{ or } B)]}{3} \text{ must BE } \leq 0.01$$

Calibrated by

Saksit Phaisanphisit

(Mr. Saksit Phaisanphisit)

Field Scientist (4)

Approved by

Nattapol Jiengwareewong

(Mr.Nattapol Jiengwareewong)

Specialist (1)



DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date : 13 Jul 23	Ambient Temperature (°C) : 29
Calibration sheet No. : C-130723-BKK_FS0469	Relative Humidity (%) : 60
Digital Temperature ID : BKK_FS0469	Reference Temperature ID : BKK_FS1144
Serial No. : 1302005	Serial No. : 201090006013
Model : XC-572-V	Model : Digicon-CC-VT-MS
	Next Calibrate : 14 Aug 24

Location	Reference Temperature °C	Digital Temperature °C	Error °C	MPE	Pass / Fail
Stack	0	0	0	±3	Pass
	25	24	-1	±3	Pass
	50	49	-1	±3	Pass
	100	101	1	±3	Pass
	150	150	0	±3	Pass
	200	200	0	±3	Pass
	250	250	0	±3	Pass
	300	300	0	±3	Pass
Probe	500	501	1	±3	Pass
	100	101	1	±3	Pass
	120	120	0	±3	Pass
	140	140	0	±3	Pass
Oven	100	101	-	±3	-
	120	121	-	±3	-
	140	141	-	±3	-
Filter	100	102	2	±3	Pass
	120	121	1	±3	Pass
	140	141	1	±3	Pass
Exit	0	0	0	±3	Pass
	10	9	-1	±3	Pass
	20	19	-1	±3	Pass
Meter	0	-1	-1	±3	Pass
	25	24	-1	±3	Pass
	50	48	-2	±3	Pass
AUX	0	0	0	±3	Pass
	25	24	-1	±3	Pass
	50	49	-1	±3	Pass

MPE : (Maximum permissible error of measurement) ค่าความผิดพลาดสูงสุดของการวัดที่อนุญาต

Calibrated by :

Saksit Phaisanphisit

(Mr. Saksit Phaisanphisit)

Field Scientist (4)

Approved by :

Nattapol Jiengwareewong

(Mr.Nattapol Jiengwareewong)

Specialist (1)



PROBE NOZZLE DIAMETER
CALIBRATION DATA SHEET

Calibration Date	13 Jul 23	Nozzle Set ID. :	BKK_FS0474
Calibration Sheet No. :	C-130723-BKK_FS0474	Vernier Caliper ID.:	BKK_FS1123

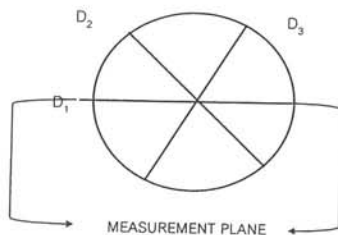
Nozzle ID #	Nozzle Diameter (cm.)			Hi - Lo	$(D_1 + D_2 + D_3) / 3$
	D_1	D_2	D_3	ΔD	D_{avg}
1	0.300	0.299	0.300	0.001	0.300
2	0.450	0.450	0.450	0.000	0.450
3	0.599	0.602	0.601	0.003	0.601
4	0.763	0.769	0.770	0.007	0.767
5	0.931	0.932	0.932	0.001	0.932
6	1.090	1.092	1.092	0.002	1.091
7	1.264	1.263	1.264	0.001	1.264
8	1.599	1.600	1.599	0.001	1.599

Where :

D_1, D_2, D_3 = There 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} = $(D_1 + D_2 + D_3) / 3$



Calibrated by : Saksit Phaisanphisut

(Mr. Saksit Phaisanphisut)

Field Scientist (4)

Approved by

Nattapon Jiengwareewong

(Mr. Nattapon Jiengwareewong)

Field Specialist (1)

FORM NO. F-001-026 REV.001/2019 - PAGE DATE: 04/1/23

CONSOLE CONTROL UNIT CALIBRATION TEST REPORT

Calibration of Date : 13-Jul-23
Next Cal. Date : 13-Jan-24

Barometric Pressure (mmHg) :

Relative Humidity (%)

Temperature (C°)

Console Control Meter Data

Calibration No. : C-130723-BKK_FS518

Dry Gas Meter ID : BKK_FS0518

Serial No. : 1504025

Model No. : XC-572-V

Reference Dry Gas Meter Data

Reference Dry Gas Meter ID :

Serial No.

Correction Factor (%)

Next Calibration Date

ΔH (mm H ₂ O)	Minutes	Reference Dry Gas Meter Calibration			Console Control : Drygas Meter		
		Vr (liters)		Tr (°C)	Vm (liters)		Ti To (°C)
15	12.10	Final 150.22	Initial 0.00	Total 150.22	Final 426310.0	Initial 426158.0	Total 152.00
25	9.32	150.20	0.00	150.20	426470.0	426317.0	153.00
50	6.51	150.23	0.00	150.23	426632.0	426480.0	152.00
100	4.59	150.40	0.00	150.40	426798.0	426646.0	152.00
150	3.75	150.20	0.00	150.20	426973.0	426820.0	153.00
				32.0			32.0

Ratio of reading of reference to dry gas meter : tolerance for individual values ± 0.02 from average.

ΔH : Orifice pressure differential that equates to 21.24 in of air @ 25 C and 760 mm of mercury , mmH₂O : tolerance for individual values ± 5
Procedure: 40 CFR 60, APP A, METH, SEC 5.3 & 7

Calibrated by :

Saksit Phaisanphisut
(Mr. Saksit Phaisanphisut)

Field Scientist(4)

Approved by :

Nattapon
(Mr. Nattapon Jiengwareewong)

Field Specialist(1)



Pitot Tube Calibration Data

Pitot Tube Identification Number : BKK_FS0522 Calibration Date : 13 Jul 23
 Lab test duct Number : 258-1-13-01 Standard Pitot ID : BKK_FS0441
 Calibration Sheet No. : C-130723-BKK_FS0522 Cp Standard : 0.99

Type S Pitot Tube Coefficient Data					
	Type s pitot tube Leg A,B	Standard pitot tube (ΔP, mm.H ₂ O)	Type s pitot tube (ΔP, mm.H ₂ O)	Cp (s) Leg A	Cp (s) Leg B
Test 1	A	12.00	17.00	0.840	-
	B	12.00	17.00	-	0.840
Test 2	A	12.00	17.00	0.840	-
	B	12.00	17.00	-	0.840
Test 3	A	12.00	16.80	0.845	-
	B	12.00	16.80	-	0.845
			\bar{C}_p	0.842	0.842

$$Cp(S) = Cp_{std} \sqrt{\frac{\Delta P(std)}{\Delta P(s)}}$$

$$[\bar{C}_{p(A)} - \bar{C}_{p(B)}] \text{ must BE } \leq 0.01$$

$$\text{Average deviation(A or B)} = \frac{\sum [Cp(s) - Cp(A \text{ or } B)]}{3} \text{ must BE } \leq 0.01$$

Calibrated by Saksit Phaisanphisit
 (Mr. Saksit Phaisanphisit)
 Field Scientist (4)

Approved by Nattapol Jiengwareewong
 (Mr. Nattapol Jiengwareewong)
 Specialist (1)

FORM NO.: F 06-025 REVISION NO.: 1 ISSUE DATE: 30 Jan 22



Pitot Tube Calibration Data

Pitot Tube Identification Number : BKK_FS0523 Calibration Date : 13 Jul 23
 Lab test duct Number : 258-1-13-01 Standard Pitot ID : BKK_FS0441
 Calibration Sheet No. : C-130723-BKK_FS0523 Cp Standard : 0.99

Type S Pitot Tube Coefficient Data					
	Type s pitot tube Leg A,B	Standard pitot tube (ΔP, mm.H ₂ O)	Type s pitot tube (ΔP, mm.H ₂ O)	Cp (s) Leg A	Cp (s) Leg B
Test 1	A	12.00	17.00	0.840	-
	B	12.00	17.00	-	0.840
Test 2	A	12.00	17.00	0.840	-
	B	12.00	17.00	-	0.840
Test 3	A	12.00	16.80	0.845	-
	B	12.00	16.80	-	0.845
			\bar{C}_p	0.842	0.842

$$Cp(S) = Cp_{std} \sqrt{\frac{\Delta P(std)}{\Delta P(s)}}$$

$$[\bar{C}_{p(A)} - \bar{C}_{p(B)}] \text{ must BE } \leq 0.01$$

$$\text{Average deviation(A or B)} = \frac{\sum [Cp(s) - Cp(A \text{ or } B)]}{3} \text{ must BE } \leq 0.01$$

Calibrated by Saksit Phaisanphisit
 (Mr. Saksit Phaisanphisit)
 Field Scientist (4)

Approved by Nattapol Jiengwareewong
 (Mr. Nattapol Jiengwareewong)
 Specialist (1)

FORM NO.: F 06-025 REVISION NO.: 1 ISSUE DATE: 30 Jan 22



DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date : 13 Jul 23		Ambient Temperature (°C) 29	
Calibration sheet No. : C-130723-BKK_FS0519		Relative Humidity (%) : 60	
Digital Temperature ID BKK_FS0519	Reference Temperature ID BKK_FS1144		
Serial No. : 1504025	Serial No. : 201090006013		
Model : XC-572-V	Model : Digicon-CC-VT-MS		
Next Calibrate : 14 Aug 24			

Location	Reference Temperature °C	Digital Temperature °C	Error °C	MPE	Pass / Fail
Stack	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
	100	100	0	±3	Pass
	150	150	0	±3	Pass
	200	200	0	±3	Pass
	250	250	0	±3	Pass
	300	300	0	±3	Pass
Probe	500	500	0	±3	Pass
	100	100	0	±3	Pass
	120	120	0	±3	Pass
	140	140	0	±3	Pass
Oven	100	100	0	±3	Pass
	120	120	0	±3	Pass
	140	140	0	±3	Pass
Filter	100	100	0	±3	Pass
	120	120	0	±3	Pass
	140	140	0	±3	Pass
Exit	0	0	0	±3	Pass
	10	10	0	±3	Pass
	20	20	0	±3	Pass
Meter	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
AUX	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass

MPE : (Maximum permissible error of measurement) ค่าความผิดพลาดสูงสุดของการวัดที่อนุญาต

Calibrated by : Saksit Phaisanphisit

Mr. Saksit Phaisanphisit
Field Scientist (4)

Approved by : Nattapon Jiengwareewong

Mr. Nattapon Jiengwareewong
Specialist (1)

FORM NO.: F 06-027 REVISION NO.: 2 ISSUE DATE: 9 Feb 23



PROBE NOZZLE DIAMETER CALIBRATION DATA SHEET

Calibration Date 13 Jul 23		Nozzle Set ID. : BKK_FS0524	
Calibration Sheet No. : C-130723-BKK_FS0524		Vernier Caliper ID. : BKK_FS1123	

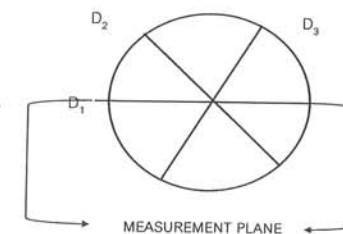
Nozzle ID #	Nozzle Diameter (cm.)			Hi - Lo ΔD	(D ₁ + D ₂ + D ₃) / 3 D _{avg}
	D ₁	D ₂	D ₃		
1	0.318	0.318	0.318	0.000	0.318
2	0.472	0.474	0.475	0.003	0.474
3	0.632	0.635	0.634	0.003	0.634
4	0.792	0.792	0.792	0.000	0.792
5	0.952	0.952	0.952	0.000	0.952
6	1.091	1.110	1.092	0.019	1.098
7	1.256	1.262	1.262	0.006	1.260
8	1.601	1.598	1.600	0.003	1.600

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 Phaisanphisit

(Mr. Saksit Phaisanphisit)
Field Scientist (4)

Approved by : Nattapon Jiengwareewong

(Mr. Nattapon Jiengwareewong)
Field Specialist (1)

FORM NO.: F 06-027 REVISION NO.: 2 ISSUE DATE: 9 Feb 23

RYG_EN0003

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6, e-mail: service.thailand@sartorius.com



NSC-TIS-TIS 17025
CALIBRATION 0426

SARTORIUS

Certificate of Calibration

REVIEW BY Thawat
APPROVED BY D. L.
NEXT CAL DATE 01/03/24

Model Number : MSE224S-100-DU
Description : Analytical Balance
Serial Number : 0031709552
ID No. : RYG_EN0003
Manufacturer : Sartorius

Certificate No. : 23BCI0115
Issued Date : Friday, March 03, 2023
Reference No. : 204833
Page No. : 1 of 2

Customer Name : ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Calibrated Place : ALS Laboratory Group (Thailand) Co., Ltd. (Balance Room)
616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Calibrated By : Mr.Chonchai Inthana
Calibration Date : Wednesday, March 01, 2023

Calibration Procedure No. : This calibration was conducted by
Using in-house calibration procedure number (WI-003)
Based on UKAS LAB 14 : 2019

Metrological data :

Capacity : 220 g Readability : 0.0001 g

Ambients Conditions:

Temperature : 23.0 °C ± 5.0 °C
Humidity : 56.0 % RH ± 10.0 % RH
Pressure : ±

Reasons for calibration

☐ New Installation ☐ Service / Repaired ☒ Re-calibration/ Maintenance

Equipment Condition: ☒ Good Operate ☐ Fair

Measurement Method UKAS Publication Ref :Lab 14

The measurement uncertainty stated is the expended 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). The calibration certificate documents the traceability to National Standards, which realise the unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came from list of Sartorius Metrological Specifications.

Traceability:

Model Number	Description	Traceability	Certificate No.	Due Date
YCS011-522-00	Sartorius weight set 1mg - 5000g E2,YCS011-522-00	SPC-RT	C02212565	14-Sep-2023
MHB-382SD	Humidity/Barometer/Temp Lutron MHB-382SD	DKSH	C19220444	5-Sep-2023

This certificate relate and apply this equipment only.
This certificate may not be reproduced other than in full except with the prior written approval of the Verification Operation Division
Sartorius (Thailand) Co., Ltd.

Mr.chonchai Inthana(Technical Manager)

S
T
A
M
P

SOP FM 33 03 February 2022

Sartorius (Thailand) Co., Ltd.

129 Rama 9 Road, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 Fax: +66 2643-8367, e-mail: service.thailand@sartorius.com

SARTORIUS

Certificate of Calibration

Model Number : MSE224S-100-DU
Description : Analytical Balance
Serial Number : 0031709552
ID No. : RYG_EN0003
Manufacturer : Sartorius

Certificate No. : 23BCI0115
Issued Date : Friday, March 03, 2023
Reference No. : 204833
Page No. : 2 of 2

Calibration Results : Without Adjustment

Repeatability

The reproducibility is the ability of a weighing instrument to display nearly identical readouts under constant test conditions when the same load within a measurement series is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express reproducibility quantitatively.

Nominal Value : (Low Load)	20.0000	200.0000
20 g	20.0001	200.0000
Tolerance	20.0000	200.0001
0.0001 g	20.0000	200.0000
	20.0000	200.0001
Nominal Value : (High Load)	20.0001	200.0001
200 g	20.0000	200.0001
Tolerance	20.0000	200.0000
0.0001 g	20.0000	200.0001
	20.0000	200.0001
Standard Deviation	0.00004	0.00005

Eccentricity (Off-center loading error)

The off-center loading error is yielded by the difference between the readout of the load, i.e. 1/3 or 1/4 of maximum capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to OIML R76).

Nominal value :	100	g
Tolerance	0.0004	g
	Difference	
1	-	
2	0.0001	
3	0.0000	
4	0.0000	
5	0.0001	
6	-	

Linearity

The linearity, also called linearity error. Describes the deviation of the characteristic curve of a weighing instrument from the linear slope.

Tolerance		0.0002 g		
Nominal Value	Conventional Mass Value	Displayed Value	Deviation	Uncertainty
(g)	(g)	(g)	(g)	(g)
0.01	0.0100	0.0100	0.0000	0.00013
0.05	0.0500	0.0500	0.0000	0.00013
0.1	0.1000	0.1000	0.0000	0.00013
0.5	0.5000	0.5000	0.0000	0.00014
1	1.0000	1.0000	0.0000	0.00014
5	5.0000	5.0000	0.0000	0.00014
10	10.0000	10.0000	0.0000	0.00014
20	20.0000	20.0000	0.0000	0.00024
50	50.0000	50.0000	0.0000	0.00015
100	100.0000	100.0000	0.0000	0.00019
200	200.0000	200.0001	0.0001	0.00032

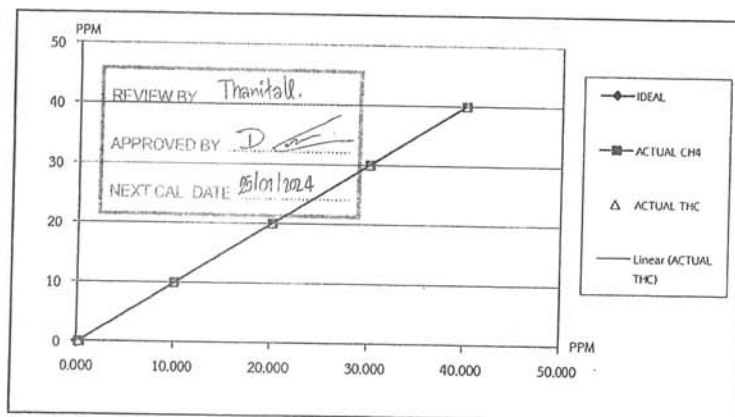
End of Report.

SOP FM 33 03 February 2022

CUSTOMER NAME	: ALS Laboratory Group (Thailand) Co., Ltd. (บริษัท เอแอลเอส แล็บราทอรี กรุ๊ป (ประเทศไทย) จำกัด)		
EQUIPMENT NAME	: THC Analyzer		
MANUFACTURER	: HORIBA	MODEL	: APHA-370
SERIAL NO	: UA3NG4TH		
STANDARD GAS CONCENTRATION (PPM)	: 506.1 PPM	CYLINDER NO	: CC734373
CYLINDER PRESSURE (psig)	: 1,600 PSI	CERTIFIED DATE	: 12/05/2020
CERTIFIED BY	: AIRGAS	EXPIRED DATE	: 12/05/2028

TEST RESULTS

POINT NO	TEST RESULTS						
	IDEAL	ACTUAL CH4	ERROR CH4	%ERROR CH4	ACTUAL THC	ERROR THC	%ERROR THC
ZERO	0.000	0.210	0.210	-	0.200	0.200	-
1	10.000	10.050	0.050	0.50	10.050	0.050	0.50
2	20.000	20.120	0.120	0.60	20.150	0.150	0.75
3	30.000	30.110	0.110	0.37	30.050	0.050	0.17
4	40.000	40.030	0.030	0.08	40.030	0.030	0.08
AVERAGE (%)				0.39			0.37



CALIBRATED BY: [Signature]

DATE: 25/1/16

CHECKED BY: [Signature]

DATE: 25/1/16

ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : เจ้าหน้าที่ฝ่ายบริการหลังการขาย , โทร 02-868-0812 # 15,16 , E-Mail : Engineer@jiranatee.com
เลขที่ 63/14-15,67/35-36 ถนนเพชรเกษม 7,7/1 แขวงวัดท่าพระ เขตบางกอกใหญ่ กรุงเทพฯ 10600 โทร 02-8680812-13 โทรสาร 02-868-1889

CUSTOMER NAME	: ALS Laboratory Group (Thailand) Co., Ltd. (บริษัท เอแอลเอส แล็บราทอรี กรุ๊ป (ประเทศไทย) จำกัด)		
EQUIPMENT NAME	: THC Analyzer		
MANUFACTURER	: HORIBA	MODEL	: APHA-370
SERIAL NO.	: U430GTH8		

TEST VALUES

NO.	THC Analyzer (APHA - 370)	UNIT	BEFORE	AFTER
1	Signal (CH4)	mV	4.300	42.400
2	Signal (THC)	mV	3.200	64.400
3	Detector	Temp °C , Standard Value : Ambient temp+(5°Cto15°C)	46.700	50.000
4	Ambient	Pressure kPa , Standard Value : (Ambient/1013x100-20)±4kPa	70.000	70.100
5	Purifier	°C , Standard Value : 390 °C to 430 °C	420.400	421.200
6	NMHC	kPa , Normal value : 8 kPa to 25 kPa	9.800	9.800
7	DC 24 V	°C , Standard Value : 230 °C to 260 °C	244.800	245.100
8	DC 5 V	V , Standard Value : 24 V ± 0.5 V	23.900	23.900
9	Bypass (Optional)	V , Standard Value : 5 V ± 0.5 V	5.000	5.000
10	Over Flow (Optional)	L/min, Normal value : 0.9 L/min or 0.3 L/min	-	-
11	CH4 Sampling Reading	L/min, Standard Value : 0.8 L/min or More	-	-
12	NMHC Sampling Reading	PPM	3.530	2.330
13	THC Sampling Reading	PPM	4.280	1.150
14	Zero Gas CH4/THC	PPM	8.810	3.480
15	Span Gas	PPM	0.21/0.20	0.00/0.00
G	Gas H2	20 PSI	54.87/55.78	40.03/40.03
			20	20

Remark : Reference EX-EN-017-56 , Ambient HC Monitor APHA-370 Operation Manual Page #81

Remark : (Ambient temperature = 5°C to 40°C)

อาการที่ตรวจพบ

- Service Maintenance

รายละเอียดการดำเนินการ

- ทำ Calibration Zero/Span , Multipoint

ผลการดำเนินการ

- เรียบร้อย เครื่องสามารถดำเนินการตรวจวัดได้ตามปกติ

CALIBRATED BY: [Signature]

DATE: 25/1/16

CHECKED BY: [Signature]

DATE: 25/1/16

ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : เจ้าหน้าที่ฝ่ายบริการหลังการขาย , โทร 02-868-0812 # 15-16 , E-Mail : Engineer@jiranatee.com
เลขที่ 63/14-15,67/35-36 ซอยเพชรเกษม 7,7/1 ถนนเพชรเกษม แขวงวัดท่าพระ เขตบางกอกใหญ่ กรุงเทพฯ 10600 โทร 02-868-0812-13 โทรสาร 02-868-1889

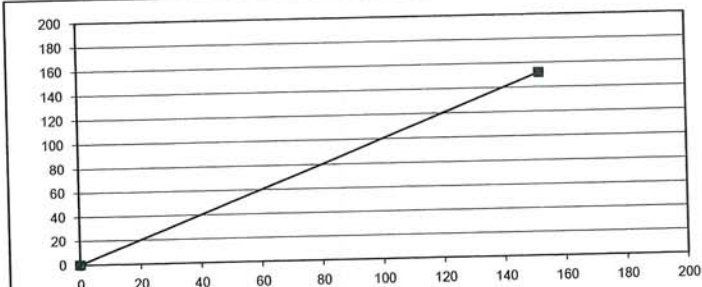


CALIBRATION REPORT

Calibration Date: 1-Jul-23
Equipment Name: FID Analyzer
Model: 9000H
Std. Gas Conc.(ppm): 152
Certified Date: 27-Jun-18
Equipment ID: BKK_FS0758
Manufacturer: Baseline Mocon
Serial No.: 0315EF0047
Cylinder No.: D878173
Expired Date: 27-Jun-26

CALIBRATION RESULTS

Point	CALIBRATION RESULTS			
	Ideal	Actual	Error	%Error
ZERO	0.00	0.02	0.02	0.02
SPAN	152.00	151.85	-0.15	-0.10
AVERAGE (%)				-0.04



Calibrated By

(Mr.Apisit Sing-ha)
Field Environmental Scientist (4)

Approved By

(Mr.Sarayuth Jitranont)
Assistant General Manager

ALS Laboratory Group



Lot No. 2321148-1

ANALYZER CALIBRATION DATA

Client: Siam Styrene Monomer Co., Ltd.
Date: 18 Sep 23
Location: Reactor Feed Heater (AF-7)
Test Operator: Sakait P.

O₂ ANALYZER
Model: TELEDYNE API 200EH
Span (%): 25
Serial No.: 774

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	-0.03	-0.01	0.08
Low-Level Gas	7.93	7.90	7.92	0.08
Span Gas	16.00	15.97	15.99	0.08

NO_x ANALYZER
Model: TELEDYNE API 200EH
Span (ppm): 200
Serial No.: 774

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.03	-0.01	0.01
Low-Level Gas	82.39	82.36	82.38	0.01
Span Gas	164.40	164.37	164.39	0.01

CO ANALYZER
Model: TELEDYNE API 300EM
Span (ppm): 500
Serial No.: 451

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.03	-0.01	0.00
Low-Level Gas	79.48	79.45	79.47	0.00
Span Gas	407.40	407.37	407.39	0.00

Calibrated by

Sakait P.

(Mr.Sakait Phaisanphisit)
Environmental Field Scientist (4)

FORM NO.: F 06-062 REVISION NO.: 2 ISSUE DATE: 3/06/19

ALS Laboratory Group



Lot No. 2321148-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Siam Styrene Monomer Co., Ltd. Location : Reactor Feed Heater (AF-7)
 Date : 18 Sep 23 Test Operator : Sakait P.

O₂ ANALYZER
 Cylinder Conc. (%) : 16.00 Span (%) : 25

	O ₂ Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.03	-0.03	0.00	-0.01	0.08	0.08
Upscale Gas	15.97	15.97	0.00	15.99	0.08	0.08

NO_x ANALYZER
 Cylinder Conc. (ppm) : 164.40 Span (ppm) : 200

	NO _x Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.03	-0.03	0.00	-0.01	0.01	0.01
Upscale Gas	164.37	164.37	0.00	164.39	0.01	0.01

CO ANALYZER
 Cylinder Conc. (ppm) : 407.40 Span (ppm) : 500

	CO Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.03	-0.03	0.00	-0.01	0.00	0.00
Upscale Gas	407.37	407.37	0.00	407.39	0.00	0.00

Calibrated by

Sakait P

(Mr.Sakait Phaisanphisut)

Environmental Field Scientist (4)

FORM NO.: F 06-062 REVISION NO.: 2 ISSUE DATE: 3/06/19

ALS Laboratory Group



EMISSION TEST RESULT

Client : Siam Styrene Monomer Co., Ltd. Run # 1
 Date : 18 Sep 23 Location : Reactor Feed Heater (AF-7)
 Start Time : 11:30 Test Operator : Sakait P.
 SO₂ Analyzer Model : TELEDYNE API 100EH Finish Time : 11:50
 NO_x/O₂ Analyzer Model : TELEDYNE API 200EH Serial No. : 437
 CO/CO₂ Analyzer Model : TELEDYNE API 300EM Serial No. : 774
 Serial No. : 451

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
11:30	5.16	9.09	25.86	-	3.64	
11:31	5.14	9.07	25.87	-	3.64	
11:32	5.10	9.08	25.76	-	3.59	
11:33	5.17	9.06	25.66	-	3.52	
11:34	5.23	9.00	25.71	-	3.49	
11:35	5.22	9.01	25.76	-	3.52	
11:36	5.21	9.02	25.72	-	3.45	
11:37	5.17	9.05	25.74	-	3.42	
11:38	5.21	9.03	25.67	-	3.42	
11:39	5.18	9.04	25.65	-	3.37	
11:40	5.21	9.04	25.76	-	3.34	
11:41	5.16	9.05	25.78	-	3.28	
11:42	5.16	9.07	25.70	-	3.26	
11:43	5.20	9.05	25.63	-	3.28	
11:44	5.19	9.05	25.70	-	3.27	
11:45	5.23	9.03	25.67	-	3.21	
11:46	5.16	9.04	25.64	-	3.18	
11:47	5.15	9.09	25.56	-	3.14	
11:48	5.08	9.11	25.48	-	3.13	
11:49	5.05	9.12	25.37	-	3.07	
11:50	5.10	9.11	25.39	-	3.10	
Average	5.17	9.05	25.67	-	3.35	

Sakait P

(Mr.Sakait Phaisanphisut)

Environmental Field Scientist (4)

FORM NO.: F 06-062 REVISION NO.: 2 ISSUE DATE: 3/06/19

ALS Laboratory Group



EMISSION TEST RESULT

Client	Siam Styrene Monomer Co., Ltd.	Run #	2
Date	18 Sep 23	Location	Reactor Feed Heater (AF-7)
Start Time	11:51	Test Operator	Sakait P.
SO ₂ Analyzer Model	TELEDYNE API 100EH	Finish Time	12:11
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.	437
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.	774
		Serial No.	451

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
11:51	5.06	9.13	25.50	-	3.04	
11:52	5.12	9.12	25.57	-	3.06	
11:53	5.13	9.08	25.60	-	3.01	
11:54	5.18	9.08	25.66	-	2.97	
11:55	5.22	9.03	25.68	-	2.97	
11:56	5.17	9.05	25.56	-	2.93	
11:57	5.14	9.04	25.54	-	2.96	
11:58	5.08	9.08	25.60	-	2.93	
11:59	5.14	9.09	25.64	-	2.92	
12:00	5.12	9.10	25.72	-	2.85	
12:01	5.16	9.06	25.78	-	2.87	
12:02	5.17	9.06	25.70	-	2.85	
12:03	5.12	9.08	25.68	-	2.81	
12:04	5.12	9.09	25.69	-	2.76	
12:05	5.10	9.10	25.75	-	2.78	
12:06	5.04	9.10	25.69	-	2.72	
12:07	5.12	9.07	25.61	-	2.79	
12:08	5.19	9.05	25.51	-	2.69	
12:09	5.23	9.03	25.49	-	2.71	
12:10	5.23	9.01	25.48	-	2.71	
12:11	5.16	9.10	25.46	-	2.73	
Average	5.14	9.07	25.61	-	2.86	

Sakait P.

(Mr.Sakait Phaisanphaut)

Environmental Field Scientist (4)



EMISSION TEST RESULT

Client	Siam Styrene Monomer Co., Ltd.	Run #	3
Date	18 Sep 23	Location	Reactor Feed Heater (AF-7)
Start Time	12:12	Test Operator	Sakait P.
SO ₂ Analyzer Model	TELEDYNE API 100EH	Finish Time	12:32
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.	437
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.	774
		Serial No.	451

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
12:12	5.17	9.05	25.41	-	2.66	
12:13	5.15	9.10	25.50	-	2.60	
12:14	5.25	9.02	25.48	-	2.67	
12:15	5.15	9.06	25.47	-	2.62	
12:16	5.16	9.06	25.52	-	2.63	
12:17	5.16	9.07	25.53	-	2.60	
12:18	5.16	9.05	25.51	-	2.61	
12:19	5.17	9.05	25.42	-	2.56	
12:20	5.17	9.07	25.46	-	2.58	
12:21	5.11	9.07	25.48	-	2.53	
12:22	4.95	9.17	25.57	-	2.53	
12:23	5.08	9.05	25.58	-	2.50	
12:24	5.20	9.04	25.59	-	2.47	
12:25	5.23	9.01	25.61	-	2.49	
12:26	5.16	9.04	25.70	-	2.49	
12:27	5.26	9.02	25.65	-	2.44	
12:28	5.20	9.03	25.67	-	2.43	
12:29	5.24	9.02	25.79	-	2.36	
12:30	5.22	9.01	25.82	-	2.37	
12:31	5.18	9.06	25.77	-	2.36	
12:32	5.11	9.09	25.66	-	2.39	
Average	5.17	9.05	25.58	-	2.52	

Sakait P.

(Mr.Sakait Phaisanphaut)

Environmental Field Scientist (4)



Lot No. 2321148-1

ANALYZER CALIBRATION DATA

Client : Siam Styrene Monomer Co., Ltd. Location : Reactor Feed Heater (AF-7)
 Date : 18 Sep 23 Test Operator : Saksit P.

O₂ ANALYZER

Model : TELEDYNE API 200EH Serial No. : 774
 Span (%) : 25

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	-0.03	-0.01	0.08
Low-Level Gas	7.93	7.90	7.92	0.08
Span Gas	16.00	15.97	15.99	0.08

NO_x ANALYZER

Model : TELEDYNE API 200EH Serial No. : 774
 Span (ppm) : 200

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.03	-0.01	0.01
Low-Level Gas	82.39	82.36	82.38	0.01
Span Gas	164.40	164.37	164.39	0.01

CO ANALYZER

Model : TELEDYNE API 300EM Serial No. : 451
 Span (ppm) : 500

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.02	-0.01	0.00
Low-Level Gas	79.48	79.46	79.47	0.00
Span Gas	407.40	407.38	407.39	0.00

Calibrated by

Saksit P.

(Mr.Saksit Phaisanphisut)

Environmental Field Scientist (4)

FORM NO.: F 06-104 REVISION NO.: - ISSUE DATE: 3/06/19

ALS Laboratory Group



Lot No. 2321148-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Siam Styrene Monomer Co., Ltd. Location : Reactor Feed Heater (AF-7)
 Date : 18 Sep 23 Test Operator : Saksit P.

O₂ ANALYZER

Cylinder Conc. (%) : 16.00 Span (%) : 25

	O ₂ Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.03	-0.03	0.00	-0.01	0.08	0.08
Upscale Gas	15.97	15.97	0.00	15.99	0.08	0.08

NO_x ANALYZER

Cylinder Conc. (ppm) : 164.40 Span (ppm) : 200

	NO _x Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.03	-0.03	0.00	-0.01	0.01	0.01
Upscale Gas	164.37	164.37	0.00	164.39	0.01	0.01

CO ANALYZER

Cylinder Conc. (ppm) : 407.40 Span (ppm) : 500

	CO Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.02	-0.02	0.00	-0.01	0.00	0.00
Upscale Gas	407.38	407.38	0.00	407.39	0.00	0.00

Calibrated by

Saksit P.

(Mr.Saksit Phaisanphisut)

Environmental Field Scientist (4)

FORM NO.: F 05-104 REVISION NO.: - ISSUE DATE: 3/06/19

ALS Laboratory Group



CEMs Data

Client Name Siam Styrene Monomer Co., Ltd.							Date 18 Sep 23						
Plant Name SSMC							Location Reactor Feed Heater (AF-7)						
Run No: 1							Run No: 2						
Date	Time	SO2	NOx	CO	O2	CO2	Date	Time	SO2	NOx	CO	O2	CO2
		ppm	ppm	ppm	Vol%	Vol%			ppm	ppm	ppm	Vol%	Vol%
18 Sep 23	11:30	-	23.37	0.30	5.06	-	18 Sep 23	11:51	-	23.13	0.26	5.18	-
18 Sep 23	11:31	-	23.42	0.28	5.12	-	18 Sep 23	11:52	-	23.27	0.25	5.18	-
18 Sep 23	11:32	-	23.54	0.27	5.18	-	18 Sep 23	11:53	-	23.23	0.26	5.19	-
18 Sep 23	11:33	-	23.40	0.29	5.18	-	18 Sep 23	11:54	-	23.07	0.27	5.18	-
18 Sep 23	11:34	-	23.35	0.29	5.25	-	18 Sep 23	11:55	-	23.23	0.29	5.12	-
18 Sep 23	11:35	-	23.62	0.28	5.14	-	18 Sep 23	11:56	-	23.35	0.30	5.09	-
18 Sep 23	11:36	-	23.50	0.29	5.16	-	18 Sep 23	11:57	-	23.36	0.27	5.18	-
18 Sep 23	11:37	-	23.44	0.26	5.12	-	18 Sep 23	11:58	-	23.44	0.28	5.09	-
18 Sep 23	11:38	-	23.49	0.25	5.02	-	18 Sep 23	11:59	-	23.34	0.28	5.21	-
18 Sep 23	11:39	-	23.30	0.24	5.18	-	18 Sep 23	12:00	-	23.18	0.27	5.10	-
18 Sep 23	11:40	-	23.08	0.26	5.14	-	18 Sep 23	12:01	-	23.44	0.27	5.10	-
18 Sep 23	11:41	-	23.08	0.27	5.25	-	18 Sep 23	12:02	-	23.33	0.23	5.14	-
18 Sep 23	11:42	-	23.24	0.29	5.10	-	18 Sep 23	12:03	-	23.29	0.27	5.03	-
18 Sep 23	11:43	-	23.25	0.29	5.23	-	18 Sep 23	12:04	-	23.11	0.28	5.11	-
18 Sep 23	11:44	-	23.24	0.27	5.17	-	18 Sep 23	12:05	-	22.99	0.29	5.24	-
18 Sep 23	11:45	-	23.17	0.28	5.15	-	18 Sep 23	12:06	-	23.20	0.27	5.15	-
18 Sep 23	11:46	-	23.15	0.28	5.13	-	18 Sep 23	12:07	-	23.26	0.30	5.22	-
18 Sep 23	11:47	-	23.10	0.29	5.13	-	18 Sep 23	12:08	-	23.10	0.29	5.14	-
18 Sep 23	11:48	-	23.12	0.27	5.09	-	18 Sep 23	12:09	-	23.08	0.33	5.18	-
18 Sep 23	11:49	-	23.41	0.28	4.99	-	18 Sep 23	12:10	-	23.10	0.30	5.13	-
18 Sep 23	11:50	-	23.21	0.28	5.15	-	18 Sep 23	12:11	-	23.44	0.33	5.24	-
Max		-	23.62	0.30	5.25	-	Max		-	23.23	0.28	5.15	-
Avg		-	23.31	0.28	5.14	-	Avg		-	23.23	0.28	5.15	-
Run No: 3							Run No: 4						
Date	Time	SO2	NOx	CO	O2	CO2	Date	Time	SO2	NOx	CO	O2	CO2
		ppm	ppm	ppm	Vol%	Vol%			ppm	ppm	ppm	Vol%	Vol%
18 Sep 23	12:12	-	23.37	0.31	5.14	-	18 Sep 23	12:33	-	23.29	0.29	5.15	-
18 Sep 23	12:13	-	23.19	0.31	5.14	-	18 Sep 23	12:34	-	23.17	0.29	5.31	-
18 Sep 23	12:15	-	23.11	0.27	5.09	-	18 Sep 23	12:35	-	23.40	0.30	5.24	-
18 Sep 23	12:16	-	23.29	0.28	5.12	-	18 Sep 23	12:36	-	23.17	0.29	5.32	-
18 Sep 23	12:17	-	23.30	0.29	5.03	-	18 Sep 23	12:37	-	23.24	0.29	5.31	-
18 Sep 23	12:18	-	23.20	0.25	5.13	-	18 Sep 23	12:38	-	23.08	0.28	5.24	-
18 Sep 23	12:19	-	23.44	0.28	5.07	-	18 Sep 23	12:39	-	23.15	0.26	5.29	-
18 Sep 23	12:20	-	23.66	0.27	4.99	-	18 Sep 23	12:40	-	23.16	0.29	5.30	-
18 Sep 23	12:21	-	23.65	0.26	4.83	-	18 Sep 23	12:41	-	23.34	0.29	5.25	-
18 Sep 23	12:22	-	23.41	0.29	5.12	-	18 Sep 23	12:42	-	23.35	0.27	5.28	-
18 Sep 23	12:23	-	23.47	0.31	5.16	-	18 Sep 23	12:43	-	23.24	0.30	5.20	-
18 Sep 23	12:24	-	23.64	0.28	5.15	-	18 Sep 23	12:44	-	23.06	0.31	5.26	-
18 Sep 23	12:25	-	23.24	0.28	5.21	-	18 Sep 23	12:45	-	23.21	0.28	5.22	-
18 Sep 23	12:26	-	23.25	0.25	5.27	-	18 Sep 23	12:46	-	23.13	0.32	5.29	-
18 Sep 23	12:27	-	23.26	0.27	5.21	-	18 Sep 23	12:47	-	23.11	0.29	5.11	-
18 Sep 23	12:28	-	23.37	0.27	5.36	-	18 Sep 23	12:48	-	23.42	0.25	5.08	-
18 Sep 23	12:29	-	23.49	0.28	5.19	-	18 Sep 23	12:49	-	23.51	0.27	4.94	-
18 Sep 23	12:30	-	23.38	0.25	5.13	-	18 Sep 23	12:50	-	23.40	0.26	5.05	-
18 Sep 23	12:31	-	23.57	0.28	5.04	-	18 Sep 23	12:51	-	23.17	0.28	5.12	-
18 Sep 23	12:32	-	23.56	0.29	4.97	-	18 Sep 23	12:52	-	23.11	0.27	4.96	-
18 Sep 23	12:33	-	23.17	0.32	5.19	-	Max		-	23.51	0.32	5.31	-
Max		-	23.66	0.32	5.36	-	Avg		-	23.23	0.28	5.19	-
Avg		-	23.38	0.28	5.12	-							
Run No: 5							Run No: 6						
Date	Time	SO2	NOx	CO	O2	CO2	Date	Time	SO2	NOx	CO	O2	CO2
		ppm	ppm	ppm	Vol%	Vol%			ppm	ppm	ppm	Vol%	Vol%
18 Sep 23	12:54	-	23.21	0.27	4.93	-	18 Sep 23	13:15	-	23.27	0.28	5.17	-
18 Sep 23	12:55	-	23.11	0.27	4.93	-	18 Sep 23	13:16	-	23.50	0.29	5.19	-
18 Sep 23	12:56	-	23.06	0.28	4.96	-	18 Sep 23	13:17	-	23.29	0.25	5.16	-
18 Sep 23	12:57	-	22.92	0.28	4.95	-	18 Sep 23	13:18	-	23.16	0.25	5.27	-
18 Sep 23	12:58	-	23.06	0.27	4.95	-	18 Sep 23	13:19	-	23.24	0.27	5.25	-
18 Sep 23	12:59	-	23.08	0.27	5.02	-	18 Sep 23	13:20	-	23.23	0.27	5.26	-
18 Sep 23	13:00	-	23.16	0.26	5.04	-	18 Sep 23	13:21	-	23.33	0.28	5.23	-
18 Sep 23	13:01	-	23.28	0.27	4.95	-	18 Sep 23	13:22	-	23.47	0.26	5.26	-
18 Sep 23	13:02	-	23.21	0.31	5.04	-	18 Sep 23	13:23	-	23.57	0.27	5.19	-
18 Sep 23	13:03	-	23.27	0.29	5.04	-	18 Sep 23	13:24	-	23.62	0.27	5.19	-
18 Sep 23	13:04	-	23.21	0.26	5.13	-	18 Sep 23	13:25	-	23.66	0.30	5.23	-
18 Sep 23	13:05	-	23.42	0.29	4.95	-	18 Sep 23	13:26	-	23.63	0.29	5.29	-
18 Sep 23	13:06	-	23.16	0.28	5.08	-	18 Sep 23	13:27	-	23.58	0.29	5.45	-
18 Sep 23	13:07	-	23.28	0.27	5.03	-	18 Sep 23	13:28	-	23.56	0.28	5.22	-
18 Sep 23	13:08	-	23.33	0.27	4.96	-	18 Sep 23	13:29	-	23.52	0.26	5.21	-
18 Sep 23	13:09	-	23.08	0.27	5.01	-	18 Sep 23	13:30	-	23.46	0.27	5.21	-
18 Sep 23	13:10	-	23.14	0.25	5.10	-	18 Sep 23	13:31	-	23.49	0.29	5.34	-
18 Sep 23	13:11	-	23.21	0.26	5.11	-	18 Sep 23	13:32	-	23.53	0.27	5.09	-
18 Sep 23	13:12	-	23.12	0.30	5.22	-	18 Sep 23	13:33	-	23.45	0.27	5.33	-
18 Sep 23	13:13	-	23.10	0.26	5.32	-	18 Sep 23	13:34	-	23.06	0.30	5.19	-
18 Sep 23	13:14	-	23.01	0.27	5.25	-	18 Sep 23	13:35	-	23.43	0.29	5.32	-
Max		-	23.42	0.31	5.32	-	Max		-	23.66	0.30	5.45	-
Avg		-	23.16	0.27	5.04	-	Avg		-	23.43	0.28	5.24	-



CEMs Data

Client Name Siam Styrene Monomer Co., Ltd.							Date 18 Sep 23						
Plant Name SSMC							Location Reactor Feed Heater (AF-7)						
Run No: 7							Run No: 8						
Date	Time	SO2	NOx	CO	O2	CO2	Date	Time	SO2	NOx	CO	O2	CO2
		ppm	ppm	ppm	Vol%	Vol%			ppm	ppm	ppm	Vol%	Vol%
18 Sep 23	13:36	-	23.50	0.29	5.18	-	18 Sep 23	13:57	-	23.33	0.30	5.10	-
18 Sep 23	13:37	-	23.23	0.28	5.18	-	18 Sep 23	13:58	-	23.49	0.28	5.04	-
18 Sep 23	13:38	-	23.34	0.26	5.13	-	18 Sep 23	13:59	-	23.36	0.29	5.18	-
18 Sep 23	13:39	-	23.51	0.25	5.26	-	18 Sep 23	14:00	-	23.15	0.29	5.12	-
18 Sep 23	13:40	-	23.48	0.26	5.38	-	18 Sep 23	14:01	-	23.39	0.30	5.03	-
18 Sep 23	13:41	-	23.47	0.26	5.20	-	18 Sep 23	14:02	-	23.34	0.27	5.14	-
18 Sep 23	13:42	-	23.49	0.24	5.09	-	18 Sep 23	14:03	-	23.35	0.26	5.05	-
18 Sep 23	13:43	-	23.55	0.27	5.09	-	18 Sep 23	14:04	-	23.53	0.27	5.00	-
18 Sep 23	13:44	-	23.33	0.27	5.05	-	18 Sep 23	14:05	-	23.54	0.29	5.05	-
18 Sep 23	13:45	-	23.53	0.28	5.21	-	18 Sep 23	14:06	-	23.51	0.27	5.04	-
18 Sep 23	13:46	-	23.52	0.26	5.18	-	18 Sep 23	14:07	-	23.68	0.26	4.97	-
18 Sep 23	13:47	-	23.42	0.29	5.10	-	18 Sep 23	14:08	-	23.63	0.28	5.07	-
18 Sep 23	13:48	-	23.28	0.29	5.04	-	18 Sep 23	14:09	-	23.57	0.27	4.98	-
18 Sep 23	13:49	-	23.27	0.26	5.12	-	18 Sep 23	14:10	-	23.15	0.28	5.34	-
18 Sep 23	13:51	-	23.12	0.26	5.12	-	18 Sep 23	14:11	-	23.33	0.28	5.42	-
18 Sep 23	13:52	-	23.30	0.28	5.10	-	18 Sep 23	14:12	-	23.37	0.28	5.41	-</



Reference Method Data

Client Name Siam Styrene Monomer Co., Ltd.
Plant Name SSMCDate 18 Sep 23
Location Reactor Feed Heater (AF-7)

Run No: 1							Run No: 2						
Time Base : 21 min							Time Base : 21 min						
Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%	Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
18 Sep 23	11:30	-	25.86	3.63	5.16	9.09	18 Sep 23	11:51	-	25.50	3.03	5.06	9.13
18 Sep 23	11:31	-	25.87	3.63	5.14	9.07	18 Sep 23	11:52	-	25.57	3.06	5.12	9.12
18 Sep 23	11:32	-	25.76	3.59	5.10	9.08	18 Sep 23	11:53	-	25.60	3.01	5.13	9.08
18 Sep 23	11:33	-	25.66	3.52	5.17	9.06	18 Sep 23	11:54	-	25.68	2.97	5.18	9.08
18 Sep 23	11:34	-	25.71	3.48	5.23	9.06	18 Sep 23	11:55	-	25.68	2.97	5.22	9.03
18 Sep 23	11:35	-	25.76	3.52	5.22	9.01	18 Sep 23	11:56	-	25.56	2.92	5.17	9.05
18 Sep 23	11:36	-	25.72	3.44	5.21	9.02	18 Sep 23	11:57	-	25.54	2.95	5.14	9.04
18 Sep 23	11:37	-	25.74	3.42	5.17	9.05	18 Sep 23	11:58	-	25.60	2.92	5.08	9.08
18 Sep 23	11:38	-	25.67	3.42	5.21	9.03	18 Sep 23	11:59	-	25.64	2.91	5.14	9.09
18 Sep 23	11:39	-	25.65	3.38	5.18	9.04	18 Sep 23	12:00	-	25.72	2.85	5.12	9.10
18 Sep 23	11:40	-	25.76	3.33	5.21	9.04	18 Sep 23	12:01	-	25.78	2.87	5.18	9.06
18 Sep 23	11:41	-	25.78	3.28	5.16	9.05	18 Sep 23	12:02	-	25.70	2.84	5.17	9.06
18 Sep 23	11:42	-	25.70	3.26	5.18	9.07	18 Sep 23	12:03	-	25.68	2.81	5.12	9.08
18 Sep 23	11:43	-	25.63	3.28	5.20	9.05	18 Sep 23	12:04	-	25.69	2.78	5.12	9.09
18 Sep 23	11:44	-	25.70	3.26	5.19	9.05	18 Sep 23	12:05	-	25.75	2.74	5.10	9.10
18 Sep 23	11:45	-	25.67	3.21	5.23	9.03	18 Sep 23	12:06	-	25.69	2.71	5.04	9.10
18 Sep 23	11:46	-	25.64	3.18	5.16	9.04	18 Sep 23	12:07	-	25.61	2.78	5.12	9.07
18 Sep 23	11:47	-	25.56	3.13	5.15	9.09	18 Sep 23	12:08	-	25.51	2.69	5.19	9.05
18 Sep 23	11:48	-	25.48	3.12	5.08	9.11	18 Sep 23	12:09	-	25.49	2.71	5.23	9.03
18 Sep 23	11:49	-	25.37	3.07	5.05	9.12	18 Sep 23	12:10	-	25.48	2.71	5.23	9.01
18 Sep 23	11:50	-	25.39	3.09	5.10	9.11	18 Sep 23	12:11	-	25.46	2.72	5.16	9.10
Max	-	-	25.87	3.63	5.23	9.12	Max	-	-	25.78	3.06	5.23	9.12
Avg	-	-	25.67	3.34	5.17	9.05	Avg	-	-	25.61	2.86	5.14	9.07

Run No: 3							Run No: 4						
Time Base : 21 min							Time Base : 21 min						
Date	Time	SO2	NOx	CO	O2	CO2	Date	Time	SO2	NOx	CO	O2	CO2
		ppm	ppm	ppm	Vol%	Vol%			ppm	ppm	ppm	Vol%	Vol%
18 Sep 23	12:12	-	25.41	2.65	5.17	9.05	18 Sep 23	12:33	-	25.81	2.36	5.08	9.12
18 Sep 23	12:13	-	25.50	2.60	5.15	9.10	18 Sep 23	12:34	-	25.54	2.33	5.17	9.08
18 Sep 23	12:14	-	25.48	2.67	5.25	9.02	18 Sep 23	12:35	-	25.50	2.36	5.18	9.02
18 Sep 23	12:15	-	25.47	2.61	5.15	9.06	18 Sep 23	12:36	-	25.71	2.22	5.51	8.75
18 Sep 23	12:16	-	25.52	2.62	5.16	9.06	18 Sep 23	12:37	-	25.83	2.28	5.31	8.95
18 Sep 23	12:17	-	25.53	2.60	5.16	9.07	18 Sep 23	12:38	-	25.80	2.30	5.24	9.03
18 Sep 23	12:18	-	25.51	2.61	5.16	9.05	18 Sep 23	12:39	-	25.59	2.24	5.27	9.05
18 Sep 23	12:19	-	25.42	2.56	5.17	9.05	18 Sep 23	12:40	-	25.56	2.24	5.28	9.01
18 Sep 23	12:20	-	25.46	2.58	5.17	9.07	18 Sep 23	12:41	-	25.60	2.24	5.23	9.02
18 Sep 23	12:21	-	25.48	2.52	5.11	9.07	18 Sep 23	12:42	-	25.53	2.26	5.24	9.01
18 Sep 23	12:22	-	25.57	2.52	4.95	9.17	18 Sep 23	12:43	-	25.57	2.20	5.34	8.98
18 Sep 23	12:23	-	25.58	2.50	5.08	9.05	18 Sep 23	12:44	-	25.48	2.23	5.30	8.99
18 Sep 23	12:24	-	25.59	2.47	5.20	9.04	18 Sep 23	12:45	-	25.38	2.18	5.25	9.02
18 Sep 23	12:25	-	25.61	2.49	5.23	9.01	18 Sep 23	12:46	-	25.26	2.18	5.23	9.04
18 Sep 23	12:26	-	25.70	2.49	5.16	9.04	18 Sep 23	12:47	-	25.26	2.18	5.24	9.01
18 Sep 23	12:27	-	25.65	2.43	5.26	9.02	18 Sep 23	12:48	-	25.33	2.15	5.29	9.01
18 Sep 23	12:28	-	25.67	2.42	5.20	9.03	18 Sep 23	12:49	-	25.29	2.15	5.24	9.02
18 Sep 23	12:29	-	25.79	2.35	5.24	9.02	18 Sep 23	12:50	-	25.33	2.18	5.16	9.06
18 Sep 23	12:30	-	25.82	2.37	5.22	9.01	18 Sep 23	12:51	-	25.36	2.12	5.12	9.12
18 Sep 23	12:31	-	25.77	2.36	5.18	9.06	18 Sep 23	12:52	-	25.49	2.08	5.04	9.13
18 Sep 23	12:32	-	25.66	2.39	5.11	9.09	18 Sep 23	12:53	-	25.53	2.08	5.04	9.15
Max	-	-	25.82	2.67	5.26	9.17	Max	-	-	25.83	2.36	5.51	9.15
Avg	-	-	25.58	2.51	5.17	9.05	Avg	-	-	25.50	2.22	5.23	9.02

Run No: 5							Run No: 6						
Time Base : 21 min							Time Base : 21 min						
Date	Time	SO2	NOx	CO	O2	CO2	Date	Time	SO2	NOx	CO	O2	CO2
		ppm	ppm	ppm	Vol%	Vol%			ppm	ppm	ppm	Vol%	Vol%
18 Sep 23	12:54	-	25.42	2.04	5.10	9.12	18 Sep 23	13:15	-	25.15	1.86	5.25	9.02
18 Sep 23	12:55	-	25.21	2.03	5.03	9.14	18 Sep 23	13:16	-	25.23	1.85	5.25	9.03
18 Sep 23	12:56	-	25.21	2.02	4.99	9.16	18 Sep 23	13:17	-	25.24	1.88	5.27	9.03
18 Sep 23	12:57	-	25.26	1.97	4.98	9.16	18 Sep 23	13:18	-	25.30	1.83	5.27	9.03
18 Sep 23	12:58	-	25.25	2.01	4.98	9.17	18 Sep 23	13:19	-	25.27	1.87	5.25	9.02
18 Sep 23	12:59	-	25.18	2.00	4.97	9.19	18 Sep 23	13:20	-	25.26	1.80	5.27	9.01
18 Sep 23	13:00	-	25.16	1.97	4.98	9.17	18 Sep 23	13:21	-	25.24	1.81	5.26	9.00
18 Sep 23	13:01	-	25.15	1.98	5.01	9.17	18 Sep 23	13:22	-	25.25	1.81	5.28	9.02
18 Sep 23	13:02	-	25.24	1.93	5.04	9.14	18 Sep 23	13:23	-	25.26	1.77	5.29	9.00
18 Sep 23	13:03	-	25.27	1.97	4.98	9.15	18 Sep 23	13:24	-	25.29	1.80	5.33	8.99
18 Sep 23	13:04	-	25.37	1.95	5.01	9.15	18 Sep 23	13:25	-	25.36	1.81	5.30	8.96
18 Sep 23	13:05	-	25.27	1.93	5.04	9.14	18 Sep 23	13:26	-	25.43	1.79	5.29	8.97
18 Sep 23	13:06	-	25.30	1.92	5.08	9.13	18 Sep 23	13:27	-	25.46	1.77	5.36	8.96
18 Sep 23	13:07	-	25.28	1.89	5.04	9.14	18 Sep 23	13:28	-	25.40	1.76	5.33	8.98
18 Sep 23	13:08	-	25.18	1.89	5.05	9.17	18 Sep 23	13:29	-	25.46	1.77	5.38	8.95
18 Sep 23	13:09	-	25.20	1.84	5.11	9.14	18 Sep 23	13:30	-	25.56	1.73	5.32	8.94
18 Sep 23	13:10	-	25.16	1.89	5.14	9.11	18 Sep 23	13:31	-	25.55	1.72	5.28	9.01
18 Sep 23	13:11	-	25.21	1.86	5.08	9.12	18 Sep 23	13:32	-	24.39	1.75	5.47	8.82
18 Sep 23	13:12	-	25.24	1.90	5.10	9.12	18 Sep 23	13:33	-	24.61	1.73	5.42	8.90
18 Sep 23	13:13	-	25.25	1.81	5.13	9.12	18 Sep 23	13:34	-	25.02	1.71	5.33	8.96
18 Sep 23	13:14	-	25.16	1.88	5.24	9.04	18 Sep 23	13:35	-	25.20	1.70	5.11	9.09
Max	-	-	25.42	2.04	5.24	9.19	Max	-	-	25.55	1.88	5.47	9.09
Avg	-	-	25.24	1.94	5.05	9.14	Avg	-	-	25.24	1.79	5.30	8.98



Reference Method Data

Client Name Siam Styrene Monomer Co., Ltd.
Plant Name SSMCDate 18 Sep 23
Location Reactor Feed Heater (AF-7)

Run No: 7							Run No: 8						
Time Base : 21 min							Time Base : 21 min						
Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%	Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
18 Sep 23	13:36	-	25.20	1.70	5.15	9.07	18 Sep 23	13:57	-	25.06	1.81	5.14	9.12
18 Sep 23	13:37	-	25.21	1.70	5.35	8.98	18 Sep 23	13:58	-	25.01	1.49	5.15	9.08
18 Sep 23	13:38	-	25.22	1.67	5.17	9.04	18 Sep 23	13:59	-	24.92	1.47	5.12	9.08
18 Sep 23	13:39	-	25.26	1.71	5.13	9.11	18 Sep 23	14:00	-	24.95	1.52	5.10	9.06
18 Sep 23	13:40	-	25.23	1.67	5.23	9.07	18 Sep 23	14:01	-	25.02	1.50	5.11	9.09
18 Sep 23	13:41	-	25.24	1.68	5.30	8.99	18 Sep 23	14:02	-	25.08	1.50	5.10	9.10
18 Sep 23	13:42	-	25.30	1.66	5.41	8.92	18 Sep 23	14:03	-	25.07	1.43	5.12	9.10
18 Sep 23	13:43	-	25.32	1.63	5.30	8.94	18 Sep 23	14:04	-	25.06	1.47	5.12	9.10
18 Sep 23	13:44	-	25.29	1.61	5.15	9.04	18 Sep 23	14:05	-	25.04	1.44	5.12	9.11
18 Sep 23	13:45	-	24.97	1.65	5.12	9.10	18 Sep 23	14:06	-	25.06	1.41	5.07	9.09
18 Sep 23	13:46	-	24.97	1.60	5.09	9.13	18 Sep 23	14:07	-	25.04	1.40	5.08	9.11
18 Sep 23	13:47	-	24.97	1.55	5.27	9.01	18 Sep 23	14:08	-	25.20	1.44	5.08	9.11
18 Sep 23	13:48	-	24.98	1.56	5.23	9.02	18 Sep 23	14:09	-	24.85	1.40	5.08	9.10
18 Sep 23	13:49	-	24.77	1.54	5.10	9.08	18 Sep 23	14:10	-	24.95	1.40	5.08	9.12
18 Sep 23	13:50	-	24.93	1.58	5.10	9.08	18 Sep 23	14:11	-	25.18	1.37	5.07	9.12
18 Sep 23	13:51	-	24.92	1.59	5.09	9.16	18 Sep 23	14:12	-	24.95	1.36	5.08	9.12
18 Sep 23	13:52	-	24.96	1.59	5.10	9.13	18 Sep 23	14:13	-	24.82	1.39	5.06	9.16
18 Sep 23	13:53	-	24.89	1.57	5.13	9.09	18 Sep 23	14:14	-	24.90	1.34	5.20	8.99
18 Sep 23	13:54	-	24.84	1.56	5.10	9.09	18 Sep 23	14:15	-	24.34	1.43	5.43	8.94
18 Sep 23	13:55	-	24.92	1.50	5.06	9.12	18 Sep 23	14:16	-	24.48	1.43	5.43	8.91
18 Sep 23	13:56	-	24.96	1.55	5.09	9.16	18 Sep 23	14:17	-	24.65	1.33	5.40	8.92
Max	-	-	25.32	1.71	5.41	9.16	Max	-	-	25.09	1.52	5.44	9.16
Avg	-	-	24.92	1.61	5.18	9.06	Avg	-	-	24.69	1.43	5.15	9.06



ANALYZER CALIBRATION DATA

Lot No. 2321156-1

Client : Siam Styrene Monomer Co., Ltd. Location : Fired Heater (AF-9)
 Date : 18 Sep 23 Test Operator : Sathapom.T

O₂ ANALYZER
 Model : TELEDYNE API 200EH Serial No. : 735
 Span (%) : 25

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	0.01	0.04	0.12
Low-Level Gas	8.04	8.05	8.06	0.04
Span Gas	16.00	16.01	16.04	0.12

NO_x ANALYZER
 Model : TELEDYNE API 200EH Serial No. : 735
 Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.02	0.05	0.03
Low-Level Gas	54.96	54.95	54.95	0.00
Span Gas	82.51	82.50	82.48	0.02

CO ANALYZER
 Model : TELEDYNE API 300EM Serial No. : 425
 Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.02	0.03	0.01
Low-Level Gas	54.84	54.83	54.82	0.01
Span Gas	79.74	79.73	79.72	0.01

Calibrated by

Sathapom Th.

(Mr.Sathapom Thakaew)

Environmental Field Scientist (3)

FORM NO.: F 06-002 REVISION NO.: 2 ISSUE DATE: 3/06/19

ALS Laboratory Group



Lot No. 2321156-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Siam Styrene Monomer Co., Ltd. Location : Fired Heater (AF-9)
 Date : 18 Sep 23 Test Operator : Sathapom.T

O₂ ANALYZER
 Cylinder Conc. (%) : 16.00 Span (%) : 25

	O ₂ Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.01	0.04	0.12	0.05	0.16	0.04
Upscale Gas	16.01	16.04	0.12	16.04	0.12	0.00

NO_x ANALYZER
 Cylinder Conc. (ppm) : 82.51 Span (ppm) : 100

	NO _x Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.02	0.05	0.03	0.05	0.03	0.00
Upscale Gas	82.50	82.43	0.07	82.40	0.10	0.03

CO ANALYZER
 Cylinder Conc. (ppm) : 79.74 Span (ppm) : 100

	CO Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.02	0.03	0.01	0.04	0.02	0.01
Upscale Gas	79.73	79.70	0.03	79.70	0.03	0.00

Calibrated by

Sathapom Th.

(Mr.Sathapom Thakaew)

Environmental Field Scientist (3)

FORM NO.: F 06-002 REVISION NO.: 2 ISSUE DATE: 3/06/19

ALS Laboratory Group



EMISSION TEST RESULT

Client	Siam Styrene Monomer Co.,Ltd.	Run #	1
Date	18 Sep 23	Location	Fired Heater (AF-9)
Start Time	11:30	Test Operator	Sathaporn.T
SO ₂ Analyzer Model	-	Finish Time	11:50
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.	-
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.	735
		Serial No.	425

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
11:30	3.34	9.89	31.06	-	1.38	
11:31	3.53	9.74	31.10	-	1.44	
11:32	3.73	9.66	31.40	-	1.43	
11:33	3.91	9.58	31.53	-	1.43	
11:34	4.13	9.55	31.51	-	1.41	
11:35	4.13	9.73	31.53	-	1.41	
11:36	3.92	9.85	31.66	-	1.46	
11:37	3.61	9.94	31.82	-	1.50	
11:38	3.47	9.98	31.74	-	1.49	
11:39	3.47	9.89	31.66	-	1.58	
11:40	3.61	9.79	31.63	-	1.65	
11:41	3.88	9.52	31.63	-	1.59	
11:42	4.13	9.52	31.63	-	1.65	
11:43	4.25	9.60	31.59	-	1.67	
11:44	4.22	9.68	31.50	-	1.69	
11:45	4.09	9.75	31.46	-	1.71	
11:46	3.91	9.84	31.43	-	1.74	
11:47	3.66	9.88	31.54	-	1.74	
11:48	3.56	9.91	31.47	-	1.76	
11:49	3.64	9.73	31.47	-	1.77	
11:50	3.72	9.66	31.48	-	1.84	
Average	3.80	9.74	31.51	-	1.59	

Sathaporn Th.

(Mr.Sathaporn Thakaew)

Environmental Field Scientist (3)



EMISSION TEST RESULT

Client	Siam Styrene Monomer Co.,Ltd.	Run #	2
Date	18 Sep 23	Location	Fired Heater (AF-9)
Start Time	11:51	Test Operator	Sathaporn.T
SO ₂ Analyzer Model	-	Finish Time	12:11
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.	-
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.	735
		Serial No.	425

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
11:51	3.99	9.51	31.47	-	1.83	
11:52	4.22	9.46	31.47	-	1.84	
11:53	4.22	9.63	31.58	-	1.86	
11:54	4.07	9.89	31.74	-	1.82	
11:55	3.70	9.93	31.78	-	1.94	
11:56	3.54	9.96	31.66	-	1.85	
11:57	3.58	9.90	31.46	-	1.93	
11:58	3.69	9.66	31.33	-	1.98	
11:59	3.86	9.67	31.32	-	2.01	
12:00	4.02	9.57	31.34	-	2.01	
12:01	4.15	9.58	31.41	-	2.01	
12:02	4.15	9.78	31.57	-	2.08	
12:03	3.87	9.98	31.80	-	1.99	
12:04	3.50	9.96	31.68	-	2.03	
12:05	3.41	9.96	31.47	-	2.04	
12:06	3.56	9.69	31.42	-	2.09	
12:07	3.86	9.68	31.54	-	2.03	
12:08	4.17	9.37	31.58	-	2.09	
12:09	4.41	9.54	31.51	-	2.10	
12:10	4.33	9.71	31.36	-	2.11	
12:11	4.02	9.84	31.36	-	2.19	
Average	3.92	9.72	31.51	-	1.99	

Sathaporn Th.

(Mr.Sathaporn Thakaew)

Environmental Field Scientist (3)



EMISSION TEST RESULT

Client	Siam Styrene Monomer Co.,Ltd.	Run #	3
Date	18 Sep 23	Location	Fired Heater (AF-9)
Start Time	12:12	Test Operator	Sathaporn.T
SO ₂ Analyzer Model	-	Finish Time	12:32
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.	-
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.	735
		Serial No.	425

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
12:12	3.72	9.78	31.60	-	2.12	
12:13	3.71	9.81	31.59	-	2.04	
12:14	3.74	9.82	31.51	-	2.12	
12:15	3.80	9.62	31.47	-	2.09	
12:16	3.98	9.68	31.53	-	2.14	
12:17	4.03	9.58	31.58	-	2.15	
12:18	4.20	9.49	31.69	-	2.13	
12:19	4.21	9.55	31.73	-	2.13	
12:20	4.18	9.67	31.76	-	2.16	
12:21	4.06	9.78	31.79	-	2.19	
12:22	3.76	10.01	31.96	-	2.21	
12:23	3.36	10.11	32.14	-	2.21	
12:24	3.21	10.04	32.17	-	2.28	
12:25	3.37	9.89	32.07	-	2.32	
12:26	3.45	9.89	31.83	-	2.30	
12:27	3.60	9.81	31.75	-	2.32	
12:28	3.81	9.70	31.83	-	2.36	
12:29	4.02	9.62	31.83	-	2.36	
12:30	4.07	9.73	31.82	-	2.29	
12:31	3.83	9.95	31.89	-	2.35	
12:32	3.46	10.05	31.99	-	2.37	
Average	3.79	9.79	31.78	-	2.22	

Sathaporn Th.

(Mr.Sathaporn Thakaew)

Environmental Field Scientist (3)



ANALYZER CALIBRATION DATA

Lot No. 2321156-1

Client	Siam Styrene Monomer Co.,Ltd.	Location	Fired Heater (AF-9)
Date	18 Sep 23	Test Operator	Sathaporn.T
O ₂ ANALYZER		Serial No.	725
Model	TELEDYNE API 200EH		
Span (%)	25		

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	0.01	0.04	0.12
Low-Level Gas	8.04	8.05	8.06	0.04
Span Gas	16.00	16.01	16.04	0.12

NO _x ANALYZER		Serial No.	725
Model	TELEDYNE API 200EH		
Span (ppm)	100		

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.02	0.05	0.03
Low-Level Gas	54.96	54.95	54.95	0.00
Span Gas	82.51	82.50	82.48	0.02

CO ANALYZER		Serial No.	425
Model	TELEDYNE API 300EM		
Span (ppm)	100		

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.02	0.03	0.01
Low-Level Gas	54.84	54.83	54.82	0.01
Span Gas	79.74	79.73	79.72	0.01

Calibrated by

Sathaporn Th.

(Mr.Sathaporn Thakaew)

Environmental Field Scientist (3)

FORM NO.: F 06-104 REVISION NO.: 2 ISSUE DATE: 3/06/19

ALS Laboratory Group



Lot No. 2321156-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Siam Styrene Monomer Co.,Ltd. Location : Fired Heater (AF-9)
Date : 18 Sep 23 Test Operator : Sathaporn.T

O₂ ANALYZER
Cylinder Conc. (%) : 16.00 Span (%) : 25

	O ₂ Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.01	0.04	0.12	0.05	0.16	0.04
Upscale Gas	16.01	16.04	0.12	16.04	0.12	0.00

NO_x ANALYZER
Cylinder Conc. (ppm) : 82.51 Span (ppm) : 100

	NO _x Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.02	0.05	0.03	0.05	0.03	0.00
Upscale Gas	82.50	82.43	0.07	82.40	0.10	0.03

CO ANALYZER
Cylinder Conc. (ppm) : 79.74 Span (ppm) : 100

	CO Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.02	0.03	0.01	0.04	0.02	0.01
Upscale Gas	79.73	79.70	0.03	79.70	0.03	0.00

Calibrated by

Sathaporn Th.

(Mr.Sathaporn Thakraw)

Environmental Field Scientist (3)

FORM NO.: F 06-104 REVISION NO.: - ISSUE DATE: 3/06/19

ALS Laboratory Group



CEMs Data

Client Name : Siam Styrene Monomer Co.,Ltd.
Plant Name : SSMC

Date : 18 Sep 23
Location : Fired Heater (AF-9)

Run No: 1

Time Base : 21 min

Date	Time	SO ₂ ppm	NO _x ppm	CO ppm	O ₂ Vol%	CO ₂ Vol%
18 Sep 23	11:30	-	30.98	1.57	4.47	-
18 Sep 23	11:31	-	31.38	1.59	4.40	-
18 Sep 23	11:32	-	31.48	1.55	4.12	-
18 Sep 23	11:33	-	31.45	1.52	3.68	-
18 Sep 23	11:34	-	31.39	1.54	3.60	-
18 Sep 23	11:35	-	31.53	1.55	3.60	-
18 Sep 23	11:36	-	31.38	1.55	3.80	-
18 Sep 23	11:37	-	31.33	1.56	4.23	-
18 Sep 23	11:38	-	31.07	1.57	4.40	-
18 Sep 23	11:39	-	31.17	1.60	4.55	-
18 Sep 23	11:40	-	30.93	1.58	4.50	-
18 Sep 23	11:41	-	30.91	1.59	4.37	-
18 Sep 23	11:42	-	31.09	1.57	4.10	-
18 Sep 23	11:43	-	31.19	1.57	3.80	-
18 Sep 23	11:44	-	31.11	1.54	3.75	-
18 Sep 23	11:45	-	31.05	1.52	3.95	-
18 Sep 23	11:46	-	31.04	1.53	3.94	-
18 Sep 23	11:47	-	30.98	1.53	4.33	-
18 Sep 23	11:48	-	30.85	1.53	4.54	-
18 Sep 23	11:49	-	31.03	1.53	4.48	-
18 Sep 23	11:50	-	31.32	1.56	4.32	-
Max		-	31.53	1.60	4.55	-
Avg		-	31.17	1.55	4.14	-

Run No: 2

Time Base : 21 min

Date	Time	SO ₂ ppm	NO _x ppm	CO ppm	O ₂ Vol%	CO ₂ Vol%
18 Sep 23	11:51	-	31.20	1.53	3.83	-
18 Sep 23	11:52	-	31.17	1.55	3.69	-
18 Sep 23	11:53	-	30.83	1.56	3.87	-
18 Sep 23	11:54	-	31.15	1.58	3.90	-
18 Sep 23	11:55	-	30.87	1.59	4.12	-
18 Sep 23	11:56	-	31.02	1.58	4.31	-
18 Sep 23	11:57	-	30.99	1.58	4.49	-
18 Sep 23	11:58	-	31.43	1.57	4.45	-
18 Sep 23	11:59	-	31.64	1.57	4.02	-
18 Sep 23	12:00	-	31.25	1.53	3.73	-
18 Sep 23	12:01	-	31.06	1.49	3.58	-
18 Sep 23	12:02	-	31.18	1.50	3.83	-
18 Sep 23	12:03	-	31.06	1.52	4.20	-
18 Sep 23	12:04	-	30.83	1.54	4.42	-
18 Sep 23	12:05	-	30.81	1.55	4.75	-
18 Sep 23	12:06	-	30.82	1.57	4.56	-
18 Sep 23	12:07	-	30.83	1.57	4.22	-
18 Sep 23	12:08	-	30.99	1.60	3.93	-
18 Sep 23	12:09	-	30.92	1.57	3.86	-
18 Sep 23	12:10	-	30.86	1.57	4.00	-
18 Sep 23	12:11	-	31.03	1.59	3.95	-
Max		-	31.64	1.60	4.75	-
Avg		-	31.04	1.56	4.05	-

Run No: 3

Time Base : 21 min

Date	Time	SO ₂ ppm	NO _x ppm	CO ppm	O ₂ Vol%	CO ₂ Vol%
18 Sep 23	12:12	-	31.05	1.60	4.27	-
18 Sep 23	12:13	-	31.20	1.57	4.30	-
18 Sep 23	12:14	-	31.08	1.58	4.50	-
18 Sep 23	12:15	-	31.30	1.57	4.48	-
18 Sep 23	12:16	-	30.91	1.54	4.42	-
18 Sep 23	12:17	-	31.21	1.56	4.31	-
18 Sep 23	12:18	-	31.57	1.53	3.91	-
18 Sep 23	12:19	-	31.76	1.53	3.45	-
18 Sep 23	12:20	-	31.66	1.52	3.27	-
18 Sep 23	12:21	-	31.41	1.56	3.72	-
18 Sep 23	12:22	-	31.32	1.54	3.64	-
18 Sep 23	12:23	-	31.39	1.56	3.80	-
18 Sep 23	12:24	-	31.37	1.56	4.09	-
18 Sep 23	12:25	-	31.29	1.58	4.35	-
18 Sep 23	12:26	-	31.23	1.55	4.34	-
18 Sep 23	12:27	-	31.48	1.55	4.09	-
18 Sep 23	12:28	-	31.50	1.54	3.57	-
18 Sep 23	12:29	-	31.29	1.55	3.55	-
18 Sep 23	12:30	-	31.41	1.55	3.49	-
18 Sep 23	12:31	-	31.28	1.53	3.94	-
18 Sep 23	12:32	-	31.23	1.56	4.27	-
Max		-	31.76	1.60	4.50	-
Avg		-	31.33	1.55	3.99	-

Run No: 4

Time Base : 21 min

Date	Time	SO ₂ ppm	NO _x ppm	CO ppm	O ₂ Vol%	CO ₂ Vol%
18 Sep 23	12:33	-	31.42	1.55	4.05	-
18 Sep 23	12:34	-	31.44	1.56	3.84	-
18 Sep 23	12:35	-	31.27	1.53	3.72	-
18 Sep 23	12:36	-	30.98	1.55	3.75	-
18 Sep 23	12:37	-	30.92	1.57	3.89	-
18 Sep 23	12:38	-	30.85	1.56	4.32	-
18 Sep 23	12:39	-	30.85	1.58	4.24	-
18 Sep 23	12:40	-	31.17	1.55	3.71	-
18 Sep 23	12:41	-	30.94	1.55	3.71	-
18 Sep 23	12:42	-	30.77	1.54	3.61	-
18 Sep 23	12:43	-	30.98	1.55	3.71	-
18 Sep 23	12:44	-	30.74	1.56	4.12	-
18 Sep 23	12:45	-	30.68	1.55	4.27	-
18 Sep 23	12:46	-	30.67	1.57	4.47	-
18 Sep 23	12:47	-	31.21	1.54	3.87	-
18 Sep 23	12:48	-	30.94	1.53	3.66	-
18 Sep 23	12:49	-	30.93	1.52	3.65	-
18 Sep 23	12:50	-	31.28	1.52	3.78	-
18 Sep 23	12:51	-	31.32	1.53	4.06	-
18 Sep 23	12:52	-	31.06	1.55	4.22	-
18 Sep 23	12:53	-	30.93	1.56	4.23	-
Max		-	31.44	1.59	4.47	-
Avg		-	31.02	1.55	3.96	-

Run No: 5

Time Base : 21 min

Date	Time	SO ₂ ppm	NO _x ppm	CO ppm	O ₂ Vol%	CO ₂ Vol%
18 Sep 23	12:54	-	30.84	1.57	4.31	-
18 Sep 23	12:55	-	31.27	1.58	4.47	-
18 Sep 23	12:56	-	31.30	1.57	3.83	-
18 Sep 23	12:57	-	30.84	1.54	3.67	-
18 Sep 23	12:58	-	30.78	1.55	3.64	-
18 Sep 23	12:59	-	31.07	1.57	3.85	-
18 Sep 23	13:00	-	30.94	1.57	4.02	-
18 Sep 23	13:01	-	31.03	1.54	4.31	-
18 Sep 23	13:02	-	31.07	1.56	4.51	-
18 Sep 23	13:03	-	31.08	1.55	4.44	-
18 Sep 23	13:04	-	31.35	1.55	4.08	-
18 Sep 23	13:05	-	31.52	1.53	3.72	-
18 Sep 23	13:06	-	31.19	1.55	3.85	-
18 Sep 23	13:07	-	31.00	1.54	3.83	-
18 Sep 23	13:08	-	31.10	1.58	4.12	-
18 Sep 23	13:09	-	31.07	1.60	4.20	-
18 Sep 23	13:10	-	30.92	1.60	4.41	-
18 Sep 23	13:11	-	31.00	1.57	4.50	-
18 Sep 23	13:12	-	30.89	1.55	4.47	-
18 Sep 23	13:13	-	31.20	1.56	3.95	-
18 Sep 23	13:14	-	30.94	1.56	3.75	-
Max		-	31.52	1.60	4.51	-
Avg		-	31.07	1.56	4.08	-

Run No: 6

Time Base : 21 min

Date	Time	SO ₂ ppm	NO _x ppm	CO ppm	O ₂ Vol%	CO ₂ Vol%
18 Sep 23	13:15	-	30.88	1.54	3.62	-
18 Sep 23	13:16	-	30.89	1.54	3.87	-
18 Sep 23	13:17	-	30.97	1.53	4.04	-
18 Sep 23	13:18	-	30.96	1.53	4.22	-
18 Sep 23	13:19	-	31.03	1.56	4.38	-
18 Sep 23	13:20	-	31.03	1.52	4.48	-
18 Sep 23	13:21	-	31.13	1.56	4.24	-
18 Sep 23	13:22	-	31.31	1.53	3.78	-
18 Sep 23	13:23	-	31.40	1.55	3.70	-
18 Sep 23	13:24	-	31.25	1.59	3.75	-
18 Sep 23	13:25	-	31.18	1.57	3.92	-
18 Sep 23	13:26	-	31.30	1.58	4.06	-
18 Sep 23	13:27	-	31.28	1.60	4.44	-
18 Sep 23	13:28	-	31.32	1.57	4.47	-
18 Sep 23	13:29	-	31.50	1.57	4.44	-
18 Sep 23	13:30	-	31.58	1.56	4.06	-
18 Sep 23	13:31	-	31.41	1.55	3.70	-
18 Sep 23	13:32	-	31.07	1.52	3.58	-
18 Sep 23	13:33	-	31.29	1.51	3.37	-
18 Sep 23	13:34	-	30.86	1.52	3.79	-
18 Sep 23	13:35	-	31.00	1.52	4.18	-
Max		-	31.58	1.60	4.48	-
Avg		-	31.18	1.55	4.00	-



CEMs Data

Client Name Siam Styrene Monomer Co.,Ltd.
Plant Name SSMC

Date 18 Sep 23
Location Fired Heater (AF-9)

Run No: 7 Time Base : 21 min							Run No: 8 Time Base : 21 min						
Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%	Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
18 Sep 23	13:36	-	31.09	1.54	4.11	-	18 Sep 23	13:57	-	31.25	1.54	3.57	-
18 Sep 23	13:37	-	30.94	1.56	4.30	-	18 Sep 23	13:58	-	31.29	1.55	3.81	-
18 Sep 23	13:38	-	31.06	1.57	4.49	-	18 Sep 23	13:59	-	31.44	1.57	4.07	-
18 Sep 23	13:39	-	31.38	1.58	4.19	-	18 Sep 23	14:00	-	31.35	1.58	4.35	-
18 Sep 23	13:40	-	31.40	1.57	3.84	-	18 Sep 23	14:01	-	31.26	1.57	4.50	-
18 Sep 23	13:41	-	31.39	1.58	3.62	-	18 Sep 23	14:02	-	31.21	1.55	4.39	-
18 Sep 23	13:42	-	31.07	1.55	3.67	-	18 Sep 23	14:03	-	31.44	1.56	3.84	-
18 Sep 23	13:43	-	31.07	1.56	4.06	-	18 Sep 23	14:04	-	31.06	1.51	3.49	-
18 Sep 23	13:44	-	31.19	1.56	4.32	-	18 Sep 23	14:05	-	31.29	1.51	3.59	-
18 Sep 23	13:45	-	31.28	1.59	4.56	-	18 Sep 23	14:06	-	31.40	1.53	3.70	-
18 Sep 23	13:46	-	31.20	1.55	4.56	-	18 Sep 23	14:07	-	31.51	1.56	3.89	-
18 Sep 23	13:47	-	31.43	1.52	4.09	-	18 Sep 23	14:08	-	31.31	1.56	4.16	-
18 Sep 23	13:48	-	31.48	1.52	3.50	-	18 Sep 23	14:09	-	31.40	1.57	4.38	-
18 Sep 23	13:49	-	30.86	1.51	3.60	-	18 Sep 23	14:10	-	31.45	1.61	4.33	-
18 Sep 23	13:50	-	31.05	1.49	3.72	-	18 Sep 23	14:11	-	31.83	1.56	3.92	-
18 Sep 23	13:51	-	30.95	1.52	4.01	-	18 Sep 23	14:12	-	31.80	1.55	3.55	-
18 Sep 23	13:52	-	31.12	1.58	4.09	-	18 Sep 23	14:13	-	31.17	1.55	3.49	-
18 Sep 23	13:53	-	31.15	1.56	4.47	-	18 Sep 23	14:14	-	31.07	1.54	3.57	-
18 Sep 23	13:54	-	31.29	1.59	4.51	-	18 Sep 23	14:15	-	30.88	1.53	3.76	-
18 Sep 23	13:55	-	31.43	1.58	4.05	-	18 Sep 23	14:16	-	31.17	1.53	3.97	-
18 Sep 23	13:56	-	31.42	1.57	3.69	-	18 Sep 23	14:17	-	31.58	1.56	4.21	-
Max		-	31.48	1.59	4.56	-	Max		-	31.83	1.61	4.50	-
Avg		-	31.20	1.56	4.07	-	Avg		-	31.35	1.55	3.93	-
Run No: 9 Time Base : 21 min							Run No: 10 Time Base : 21 min						
Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%	Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
18 Sep 23	14:18	-	31.37	1.54	4.46	-	18 Sep 23	14:38	-	31.39	1.56	3.62	-
18 Sep 23	14:19	-	31.59	1.57	4.36	-	18 Sep 23	14:40	-	31.17	1.57	3.78	-
18 Sep 23	14:20	-	31.50	1.52	3.95	-	18 Sep 23	14:41	-	31.15	1.58	3.85	-
18 Sep 23	14:21	-	31.40	1.52	3.71	-	18 Sep 23	14:42	-	31.38	1.60	4.08	-
18 Sep 23	14:22	-	31.51	1.53	3.69	-	18 Sep 23	14:43	-	31.61	1.54	4.18	-
18 Sep 23	14:23	-	31.82	1.55	3.87	-	18 Sep 23	14:44	-	31.79	1.56	4.42	-
18 Sep 23	14:24	-	31.54	1.57	3.75	-	18 Sep 23	14:45	-	31.77	1.58	4.55	-
18 Sep 23	14:25	-	31.49	1.56	4.09	-	18 Sep 23	14:46	-	31.77	1.55	4.22	-
18 Sep 23	14:26	-	31.64	1.58	4.28	-	18 Sep 23	14:47	-	32.01	1.53	3.76	-
18 Sep 23	14:27	-	31.65	1.62	4.51	-	18 Sep 23	14:48	-	31.81	1.55	3.76	-
18 Sep 23	14:28	-	31.82	1.62	4.39	-	18 Sep 23	14:49	-	31.86	1.54	3.77	-
18 Sep 23	14:29	-	32.01	1.58	4.18	-	18 Sep 23	14:50	-	31.51	1.57	3.84	-
18 Sep 23	14:30	-	32.22	1.57	3.75	-	18 Sep 23	14:51	-	31.59	1.56	4.00	-
18 Sep 23	14:31	-	32.18	1.56	3.71	-	18 Sep 23	14:52	-	31.46	1.55	4.25	-
18 Sep 23	14:32	-	31.63	1.54	3.57	-	18 Sep 23	14:53	-	31.81	1.56	4.28	-
18 Sep 23	14:33	-	31.53	1.55	3.88	-	18 Sep 23	14:54	-	31.81	1.59	4.40	-
18 Sep 23	14:34	-	31.18	1.53	4.12	-	18 Sep 23	14:55	-	31.82	1.59	4.60	-
18 Sep 23	14:35	-	31.12	1.54	4.30	-	18 Sep 23	14:56	-	31.57	1.60	4.43	-
18 Sep 23	14:36	-	31.40	1.56	4.22	-	18 Sep 23	14:57	-	31.79	1.56	3.65	-
18 Sep 23	14:37	-	31.41	1.54	4.18	-	18 Sep 23	14:58	-	31.70	1.56	3.52	-
18 Sep 23	14:38	-	31.54	1.55	3.89	-	18 Sep 23	14:59	-	31.65	1.54	3.57	-
Max		-	32.22	1.62	4.51	-	Max		-	32.01	1.60	4.60	-
Avg		-	31.60	1.56	4.03	-	Avg		-	31.64	1.57	4.03	-
Run No: 11 Time Base : 21 min							Run No: 12 Time Base : 21 min						
Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%	Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
18 Sep 23	15:00	-	31.27	1.55	3.68	-	18 Sep 23	15:21	-	31.39	1.53	4.54	-
18 Sep 23	15:01	-	31.23	1.56	3.86	-	18 Sep 23	15:22	-	31.41	1.55	4.42	-
18 Sep 23	15:02	-	31.46	1.56	4.14	-	18 Sep 23	15:23	-	31.42	1.54	4.10	-
18 Sep 23	15:03	-	31.29	1.53	4.43	-	18 Sep 23	15:24	-	31.59	1.57	3.67	-
18 Sep 23	15:04	-	31.35	1.53	4.48	-	18 Sep 23	15:25	-	31.49	1.56	3.58	-
18 Sep 23	15:05	-	31.70	1.56	4.21	-	18 Sep 23	15:26	-	31.54	1.55	3.64	-
18 Sep 23	15:06	-	31.54	1.54	3.77	-	18 Sep 23	15:27	-	31.57	1.58	3.82	-
18 Sep 23	15:07	-	31.21	1.53	3.68	-	18 Sep 23	15:28	-	31.52	1.58	4.20	-
18 Sep 23	15:08	-	31.13	1.52	3.62	-	18 Sep 23	15:29	-	31.44	1.57	4.31	-
18 Sep 23	15:09	-	31.26	1.56	3.76	-	18 Sep 23	15:30	-	31.72	1.56	4.07	-
18 Sep 23	15:10	-	31.20	1.57	3.94	-	18 Sep 23	15:31	-	31.77	1.53	3.88	-
18 Sep 23	15:11	-	31.38	1.58	4.25	-	18 Sep 23	15:32	-	31.48	1.53	3.62	-
18 Sep 23	15:12	-	31.39	1.57	4.53	-	18 Sep 23	15:33	-	31.52	1.51	3.88	-
18 Sep 23	15:13	-	31.41	1.58	4.58	-	18 Sep 23	15:34	-	31.55	1.51	3.81	-
18 Sep 23	15:14	-	31.65	1.57	4.04	-	18 Sep 23	15:35	-	31.47	1.50	4.06	-
18 Sep 23	15:15	-	31.88	1.55	3.72	-	18 Sep 23	15:36	-	31.38	1.53	4.22	-
18 Sep 23	15:16	-	31.69	1.54	3.76	-	18 Sep 23	15:37	-	31.42	1.57	4.50	-
18 Sep 23	15:17	-	31.67	1.53	3.84	-	18 Sep 23	15:38	-	31.39	1.58	4.46	-
18 Sep 23	15:18	-	31.50	1.52	3.97	-	18 Sep 23	15:39	-	31.53	1.59	4.51	-
18 Sep 23	15:19	-	31.46	1.55	4.41	-	18 Sep 23	15:40	-	31.79	1.60	4.47	-
18 Sep 23	15:20	-	31.51	1.52	4.44	-	18 Sep 23	15:41	-	31.95	1.59	4.28	-
Max		-	31.88	1.59	4.58	-	Max		-	31.95	1.60	4.54	-
Avg		-	31.44	1.55	4.05	-	Avg		-	31.54	1.55	4.08	-



Reference Method Data

Client Name Siam Styrene Monomer Co.,Ltd.
Plant Name SSMC

Date 18 Sep 23
Location Fired Heater (AF-9)

Run No: 1							Run No: 2							Run No: 3							Run No: 4							Run No: 5							Run No: 6						
Time Base : 21 min							Time Base : 21 min							Time Base : 21 min							Time Base : 21 min							Time Base : 21 min							Time Base : 21 min						
Date	Time	SO2	NOx	CO	O2	CO2	Date	Time	SO2	NOx	CO	O2	CO2	Date	Time	SO2	NOx	CO	O2	CO2	Date	Time	SO2	NOx	CO	O2	CO2	Date	Time	SO2	NOx	CO	O2	CO2							
		ppm	ppm	ppm	Vol%	Vol%			ppm	ppm	ppm	Vol%	Vol%			ppm	ppm	ppm	Vol%	Vol%			ppm	ppm	ppm	Vol%	Vol%			ppm	ppm	ppm	Vol%	Vol%							
18 Sep 23	11:30	-	31.06	1.38	3.34	9.89	18 Sep 23	11:51	-	31.47	1.83	3.99	9.51	18 Sep 23	12:12	-	31.83	2.43	3.31	10.01	18 Sep 23	12:33	-	31.83	2.43	3.31	10.01	18 Sep 23	12:54	-	31.73	2.53	3.55	9.73							
18 Sep 23	11:31	-	31.10	1.44	3.53	9.74	18 Sep 23	11:52	-	31.47	1.84	4.22	9.46	18 Sep 23	12:13	-	31.75	2.38	3.34	9.87	18 Sep 23	12:34	-	31.75	2.38	3.34	9.87	18 Sep 23	12:55	-	31.99	2.49	3.77	9.77							
18 Sep 23	11:32	-	31.40	1.43	3.73	9.66	18 Sep 23	11:53	-	31.58	1.86	4.22	9.63	18 Sep 23	12:14	-	31.51	2.12	3.74	9.82	18 Sep 23	12:35	-	31.71	2.38	3.62	9.79	18 Sep 23	12:56	-	31.88	2.49	3.95	9.71							
18 Sep 23	11:33	-	31.53	1.43	3.91	9.58	18 Sep 23	11:54	-	31.74	1.82	4.07	9.89	18 Sep 23	12:15	-	31.47	2.09	3.80	9.82	18 Sep 23	12:36	-	31.78	2.34	3.85	9.64	18 Sep 23	12:57	-	31.76	2.58	4.05	9.60							
18 Sep 23	11:34	-	31.51	1.41	4.13	9.55	18 Sep 23	11:55	-	31.78	1.94	3.70	9.93	18 Sep 23	12:16	-	31.53	2.14	3.98	9.68	18 Sep 23	12:37	-	31.78	2.34	3.85	9.64	18 Sep 23	12:58	-	31.76	2.57	4.12	9.81							
18 Sep 23	11:35	-	31.53	1.41	4.13	9.73	18 Sep 23	11:56	-	31.66	1.85	3.54	9.96	18 Sep 23	12:17	-	31.58	2.15	4.08	9.66	18 Sep 23	12:38	-	31.90	2.41	3.88	10.02	18 Sep 23	12:59	-	31.79	2.62	3.70	9.99							
18 Sep 23	11:36	-	31.66	1.46	3.92	9.85	18 Sep 23	11:57	-	31.46	1.93	3.58	9.90	18 Sep 23	12:18	-	31.48	2.13	4.20	9.69	18 Sep 23	12:39	-	31.88	2.38	3.52	9.95	18 Sep 23	13:00	-	31.66	2.64	3.46	9.99							
18 Sep 23	11:37	-	31.82	1.50	3.61	9.94	18 Sep 23	11:58	-	31.33	1.98	3.69	9.66	18 Sep 23	12:19	-	31.73	2.13	4.21	9.55	18 Sep 23	12:40	-	31.79	2.37	3.51	9.83	18 Sep 23	13:01	-	31.66	2.64	3.46	9.99							
18 Sep 23	11:38	-	31.74	1.49	3.47	9.98	18 Sep 23	11:59	-	31.32	2.01	3.86	9.67	18 Sep 23	12:20	-	31.62	2.16	4.18	9.67	18 Sep 23	12:41	-	31.62	2.42	3.74	9.83	18 Sep 23	13:02	-	31.52	2.66	3.56	9.80							
18 Sep 23	11:39	-	31.66	1.58	3.47	9.89	18 Sep 23	12:00	-	31.34	2.01	4.02	9.57	18 Sep 23	12:21	-	31.59	2.18	4.06	9.78	18 Sep 23	12:42	-	31.59	2.37	3.99	9.62	18 Sep 23	13:03	-	31.47	2.62	3.42	9.89							
18 Sep 23	11:40	-	31.63	1.65	3.61	9.79	18 Sep 23	12:01	-	31.41	2.01	4.15	9.58	18 Sep 23	12:22	-	31.96	2.21	3.76	10.01	18 Sep 23	12:43	-	31.59	2.38	3.99	9.68	18 Sep 23	13:04	-	31.52	2.66	3.56	9.80							
18 Sep 23	11:41	-	31.63	1.59	3.88	9.52	18 Sep 23	12:02	-	31.57	2.08	4.15	9.70	18 Sep 23	12:23	-	32.17	2.28	3.21	10.11	18 Sep 23	12:44	-	31.64	2.39	3.82	9.91	18 Sep 23	13:05	-	31.59	2.65	3.74	9.65							
18 Sep 23	11:42	-	31.63	1.65	4.13	9.52	18 Sep 23	12:03	-	31.80	1.99	3.87	9.98	18 Sep 23	12:24	-	32.17	2.28	3.21	10.11	18 Sep 23	12:45	-	31.64	2.39	3.82	9.91	18 Sep 23	13:06	-	31.74	2.69	4.17	9.82							
18 Sep 23	11:43	-	31.59	1.67	4.25	9.60	18 Sep 23	12:04	-	31.68	2.03	3.50	9.96	18 Sep 23	12:25	-	32.07	2.32	3.37	9.89	18 Sep 23	12:46	-	31.75	2.32	3.60	9.89	18 Sep 23	13:07	-	31.88	2.60	4.17	9.82							
18 Sep 23	11:44	-	31.50	1.69	4.22	9.68	18 Sep 23	12:05	-	31.47	2.04	3.41	9.95	18 Sep 23	12:26	-	31.83	2.30	3.37	9.89	18 Sep 23	12:47	-	31.75	2.32	3.60	9.89	18 Sep 23	13:08	-	31.76	2.58	4.05	9.60							
18 Sep 23	11:45	-	31.46	1.71	4.09	9.75	18 Sep 23	12:06	-	31.42	2.09	3.56	9.69	18 Sep 23	12:27	-	31.75	2.32	3.60	9.89	18 Sep 23	12:48	-	31.75	2.32	3.60	9.89	18 Sep 23	13:09	-	31.79	2.60	3.79	9.90							
18 Sep 23	11:46	-	31.43	1.74	3.91	9.84	18 Sep 23	12:07	-	31.54	2.03	3.86	9.68	18 Sep 23	12:28	-	31.83	2.36	3.81	9.70	18 Sep 23	12:49	-	31.78	2.34	3.85	9.64	18 Sep 23	13:10	-	31.66	2.64	3.46	9.99							
18 Sep 23	11:47	-	31.54	1.74	3.66	9.88	18 Sep 23	12:08	-	31.58	2.08	4.17	9.37	18 Sep 23	12:29	-	31.83	2.38	4.02	9.62	18 Sep 23	12:50	-	31.45	2.48	3.96	9.55	18 Sep 23	13:11	-	31.47	2.62	3.42	9.89							
18 Sep 23	11:48	-	31.47	1.76	3.56	9.91	18 Sep 23	12:09	-	31.51	2.10	4.41	9.54	18 Sep 23	12:30	-	31.82	2.38	4.02	9.62	18 Sep 23	12:51	-	31.58	2.48	3.96	9.55	18 Sep 23	13:12	-	31.52	2.66	3.56	9.80							
18 Sep 23	11:49	-	31.47	1.77	3.64	9.73	18 Sep 23	12:10	-	31.36	2.11	4.33	9.71	18 Sep 23	12:31	-	31.89	2.35	3.83	9.95	18 Sep 23	12:52	-	31.61	2.54	3.49	10.01	18 Sep 23	13:13	-	31.69	2.72	3.98	9.55							
18 Sep 23	11:50	-	31.48	1.84	3.72	9.68	18 Sep 23	12:11	-	31.36	2.19	4.02	9.84	18 Sep 23	12:32	-	31.99	2.37	3.46	10.06	18 Sep 23	12:53	-	31.58	2.51	3.44	9.92	18 Sep 23	13:14	-	31.76	2.72	4.10	9.54							
Max	-	-	31.82	1.84	4.25	9.98	Max	-	-	31.80	2.19	4.41	9.98	Max	-	-	32.17	2.27	3.21	10.11	Max	-	-	31.90	2.54	4.12	10.02	Max	-	-	32.06	2.79	4.17	10.00							
Avg	-	-	31.51	1.59	3.80	9.74	Avg	-	-	31.51	1.99	3.92	9.72	Avg	-	-	31.78	2.22	3.79	9.79	Avg	-	-	31.64	2.42	3.67	9.84	Avg	-	-	31.77	2.64	3.80	9.70							



Reference Method Data

Client Name : Siam Styrene Monomer Co., Ltd.
Plant Name : SSMCDate : 18 Sep 23
Location : Fired Heater (AF-9)

Run No: 7

Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
18 Sep 23	13:36	-	31.89	2.80	3.35	10.06
18 Sep 23	13:37	-	31.72	2.85	3.24	9.91
18 Sep 23	13:38	-	31.63	2.93	3.45	9.80
18 Sep 23	13:39	-	31.63	2.86	3.81	9.74
18 Sep 23	13:40	-	31.74	2.89	3.94	9.68
18 Sep 23	13:41	-	31.82	2.88	3.98	9.53
18 Sep 23	13:42	-	31.83	2.91	4.16	9.69
18 Sep 23	13:43	-	31.59	2.86	3.95	9.86
18 Sep 23	13:44	-	32.05	2.83	3.65	10.00
18 Sep 23	13:45	-	32.05	2.87	3.41	9.95
18 Sep 23	13:46	-	31.93	2.87	3.43	9.77
18 Sep 23	13:47	-	31.75	2.93	3.72	9.75
18 Sep 23	13:48	-	31.79	2.88	3.97	9.51
18 Sep 23	13:49	-	31.86	2.92	4.20	9.51
18 Sep 23	13:50	-	32.00	2.98	4.21	9.76
18 Sep 23	13:51	-	32.21	2.96	3.86	10.07
18 Sep 23	13:52	-	32.17	3.05	3.40	10.02
18 Sep 23	13:53	-	31.90	2.93	3.36	9.92
18 Sep 23	13:54	-	31.74	3.05	3.44	9.78
18 Sep 23	13:55	-	31.72	2.96	3.68	9.78
18 Sep 23	13:56	-	31.75	2.92	3.84	9.58
Max	-	-	32.21	3.05	4.21	10.07
Avg	-	-	31.86	2.91	3.71	9.79

Run No: 9

Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
18 Sep 23	14:18	-	31.84	3.09	3.31	9.87
18 Sep 23	14:19	-	31.67	3.12	3.48	9.80
18 Sep 23	14:20	-	31.71	3.10	3.70	9.70
18 Sep 23	14:21	-	31.84	3.13	3.93	9.55
18 Sep 23	14:22	-	32.20	3.09	4.13	9.56
18 Sep 23	14:23	-	32.22	3.12	4.08	9.88
18 Sep 23	14:24	-	32.24	3.08	3.72	10.03
18 Sep 23	14:25	-	32.24	3.09	3.40	9.99
18 Sep 23	14:26	-	32.31	3.17	3.44	10.00
18 Sep 23	14:27	-	32.35	3.14	3.42	9.98
18 Sep 23	14:28	-	32.30	3.10	3.48	9.75
18 Sep 23	14:29	-	32.19	3.11	3.75	9.63
18 Sep 23	14:30	-	32.21	3.16	3.99	9.50
18 Sep 23	14:31	-	32.37	3.03	4.16	9.61
18 Sep 23	14:32	-	32.51	3.07	4.12	9.67
18 Sep 23	14:33	-	32.58	3.09	3.92	9.87
18 Sep 23	14:34	-	32.68	3.09	3.60	9.90
18 Sep 23	14:35	-	32.64	3.09	3.50	10.03
18 Sep 23	14:36	-	32.49	3.20	3.40	9.87
18 Sep 23	14:37	-	32.24	3.11	3.58	9.81
18 Sep 23	14:38	-	32.02	3.14	3.78	9.65
Max	-	-	32.68	3.20	4.16	10.03
Avg	-	-	32.23	3.11	3.71	9.80

Run No: 11

Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
18 Sep 23	15:00	-	32.45	3.14	4.08	9.84
18 Sep 23	15:01	-	32.44	3.21	3.52	10.03
18 Sep 23	15:02	-	32.33	3.17	3.29	10.07
18 Sep 23	15:03	-	32.21	3.19	3.30	10.08
18 Sep 23	15:04	-	32.07	3.22	3.35	9.84
18 Sep 23	15:05	-	31.93	3.21	3.54	9.70
18 Sep 23	15:06	-	31.91	3.21	3.80	9.58
18 Sep 23	15:07	-	32.01	3.23	4.04	9.54
18 Sep 23	15:08	-	32.09	3.18	4.13	9.66
18 Sep 23	15:09	-	32.31	3.15	3.94	9.85
18 Sep 23	15:10	-	32.33	3.18	3.56	10.03
18 Sep 23	15:11	-	32.13	3.22	3.36	9.97
18 Sep 23	15:12	-	31.88	3.26	3.23	9.88
18 Sep 23	15:13	-	31.82	3.32	3.42	9.78
18 Sep 23	15:14	-	31.87	3.21	3.62	9.66
18 Sep 23	15:15	-	32.05	3.22	3.89	9.49
18 Sep 23	15:16	-	32.07	3.26	4.16	9.48
18 Sep 23	15:17	-	32.11	3.17	4.19	9.74
18 Sep 23	15:18	-	32.27	3.23	3.82	9.92
18 Sep 23	15:19	-	32.36	3.22	3.55	9.93
18 Sep 23	15:20	-	32.28	3.19	3.49	9.88
Max	-	-	32.45	3.32	4.19	10.08
Avg	-	-	32.14	3.21	3.68	9.81

Run No: 8

Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
18 Sep 23	13:57	-	31.85	2.99	4.12	9.46
18 Sep 23	13:58	-	31.94	2.95	4.21	9.74
18 Sep 23	13:59	-	32.11	2.95	3.85	9.90
18 Sep 23	14:00	-	32.12	2.94	3.51	10.07
18 Sep 23	14:01	-	31.97	2.94	3.38	9.90
18 Sep 23	14:02	-	31.84	2.95	3.53	9.74
18 Sep 23	14:03	-	31.89	2.96	3.78	9.61
18 Sep 23	14:04	-	32.01	2.95	4.02	9.55
18 Sep 23	14:05	-	32.06	2.91	4.16	9.72
18 Sep 23	14:06	-	32.08	3.00	4.11	9.90
18 Sep 23	14:07	-	32.04	3.03	3.66	10.06
18 Sep 23	14:08	-	31.94	3.00	3.34	9.99
18 Sep 23	14:09	-	31.85	2.97	3.26	9.94
18 Sep 23	14:10	-	31.97	3.01	3.44	9.89
18 Sep 23	14:11	-	32.13	3.05	2.63	9.83
18 Sep 23	14:12	-	32.17	2.98	2.87	9.68
18 Sep 23	14:13	-	32.11	3.02	4.06	9.63
18 Sep 23	14:14	-	32.21	3.01	4.04	9.73
18 Sep 23	14:15	-	32.36	2.99	3.77	10.00
18 Sep 23	14:16	-	32.38	2.96	3.42	10.08
18 Sep 23	14:17	-	32.05	3.06	3.28	9.98
Max	-	-	32.38	3.06	4.21	10.08
Avg	-	-	32.05	2.98	3.74	9.82

Run No: 10

Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
18 Sep 23	14:39	-	31.89	3.16	3.98	9.59
18 Sep 23	14:40	-	31.90	3.16	4.00	9.71
18 Sep 23	14:41	-	32.04	3.20	3.92	9.75
18 Sep 23	14:42	-	32.12	3.12	3.68	9.98
18 Sep 23	14:43	-	32.16	3.14	3.48	9.95
18 Sep 23	14:44	-	32.06	3.10	3.47	9.96
18 Sep 23	14:45	-	31.97	3.24	3.55	9.75
18 Sep 23	14:46	-	31.95	3.17	3.76	9.74
18 Sep 23	14:47	-	32.09	3.10	3.88	9.63
18 Sep 23	14:48	-	32.37	3.07	4.08	9.50
18 Sep 23	14:49	-	32.52	3.15	4.14	9.69
18 Sep 23	14:50	-	32.58	3.15	3.92	9.84
18 Sep 23	14:51	-	32.60	3.19	3.60	9.84
18 Sep 23	14:52	-	32.53	3.19	3.53	9.89
18 Sep 23	14:53	-	32.39	3.19	3.53	9.92
18 Sep 23	14:54	-	32.29	3.21	3.57	9.77
18 Sep 23	14:55	-	32.20	3.17	3.68	9.69
18 Sep 23	14:56	-	32.31	3.20	3.87	9.58
18 Sep 23	14:57	-	32.41	3.23	3.87	9.61
18 Sep 23	14:58	-	32.51	3.21	4.09	9.48
18 Sep 23	14:59	-	32.48	3.21	4.23	9.55
Max	-	-	32.60	3.24	4.23	9.98
Avg	-	-	32.25	3.17	3.80	9.73

Run No: 12

Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
18 Sep 23	15:21	-	32.10	3.39	3.53	9.81
18 Sep 23	15:22	-	32.06	3.45	3.71	9.58
18 Sep 23	15:23	-	32.15	3.46	4.04	9.50
18 Sep 23	15:24	-	32.21	3.29	4.16	9.54
18 Sep 23	15:25	-	32.16	3.24	4.18	9.58
18 Sep 23	15:26	-	32.15	3.24	4.09	9.73
18 Sep 23	15:27	-	32.21	3.23	3.82	9.94
18 Sep 23	15:28	-	32.27	3.24	3.46	10.00
18 Sep 23	15:29	-	32.20	3.27	3.35	9.87
18 Sep 23	15:30	-	32.09	3.36	3.40	9.89
18 Sep 23	15:31	-	32.13	3.36	3.55	9.79
18 Sep 23	15:32	-	32.19	3.27	3.80	9.61
18 Sep 23	15:33	-	32.15	3.26	3.98	9.62
18 Sep 23	15:34	-	32.24	3.22	3.79	9.92
18 Sep 23	15:35	-	32.40	3.20	3.48	10.10
18 Sep 23	15:36	-	32.33	3.27	3.39	9.95
18 Sep 23	15:37	-	32.12	3.24	3.42	9.86
18 Sep 23	15:38	-	32.13	3.28	3.55	9.69
18 Sep 23	15:39	-	32.11	3.34	3.77	9.71
18 Sep 23	15:40	-	32.15	3.33	3.96	9.54
18 Sep 23	15:41	-	32.17	3.30	4.11	8.74
Max	-	-	32.40	3.48	4.18	10.10
Avg	-	-	32.17	3.30	3.74	9.71



ANALYZER CALIBRATION DATA

Lot No. : 2321157-1

Client : Siam Styrene Monomer Co., Ltd. Location : Styrene Furnace
Date : 19 Sep 23 Test Operator : Sakait P.O2 ANALYZER
Model : TELEDYNE API 200EH Serial No. : 774
Span (%) : 25

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	-0.03	-0.01	0.08
Low-Level Gas	7.93	7.90	7.92	0.08
Span Gas	16.00	15.97	15.99	0.08

NOx ANALYZER
Model : TELEDYNE API 200EH Serial No. : 774
Span (ppm) : 200

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.05	-0.01	0.02
Low-Level Gas	82.39	82.34	82.38	0.02
Span Gas	164.40	164.35	164.39	0.02

SO2 ANALYZER
Model : TELEDYNE API 100EH Serial No. : 437
Span (ppm) : 200

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.02	-0.01	0.01
Low-Level Gas	78.75	78.73	78.74	0.00
Span Gas	159.90	159.88	159.89	0.00

CO ANALYZER
Model : TELEDYNE API 300EM Serial No. : 451
Span (ppm) : 500

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.03	-0.01	0.00
Low-Level Gas	79.48	79.45	79.47	0.00
Span Gas	407.40	407.37	407.39	0.00

Calibrated by

(Mr. Sakait Phaisanphisut)

Environmental Field Scientist (4)



Lot No. 2321157-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Siam Styrene Monomer Co., Ltd. Location : Styrene Furnace
 Date : 19 Sep 23 Test Operator : Sakait P.

O₂ ANALYZER : 16.00 Span (%) : 25
 Cylinder Conc. (%) :

	O ₂ Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.03	-0.03	0.00	-0.01	0.08	0.08
Upscale Gas	15.97	15.97	0.00	15.99	0.08	0.08

NO_x ANALYZER : 164.40 Span (ppm) : 200
 Cylinder Conc. (ppm) :

	NO _x Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.05	-0.05	0.00	-0.01	0.02	0.02
Upscale Gas	164.35	164.35	0.00	164.39	0.02	0.02

SO₂ ANALYZER : 159.90 Span (ppm) : 200
 Cylinder Conc. (ppm) :

	SO ₂ Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.02	-0.02	0.00	-0.01	0.01	0.01
Upscale Gas	159.88	159.88	0.00	159.89	0.00	0.00

CO ANALYZER : 407.40 Span (ppm) : 500
 Cylinder Conc. (ppm) :

	CO Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.03	-0.03	0.00	-0.01	0.00	0.00
Upscale Gas	407.37	407.37	0.00	407.39	0.00	0.00

Calibrated by

Sakait P

(Mr.Sakait Phaisanphisut)

Environmental Field Scientist (4)

FORM NO.: F 05-062 REVISION NO.: 2 ISSUE DATE: 3/06/19

ALS Laboratory Group



EMISSION TEST RESULT

Client : Siam Styrene Monomer Co., Ltd. Run # : 1
 Date : 19 Sep 23 Location : Styrene Furnace
 Start Time : 11:30 Test Operator : Sakait P.
 SO₂ Analyzer Model : TELEDYNE API 100EH Finish Time : 11:50
 NO_x/O₂ Analyzer Model : TELEDYNE API 200EH Serial No. : 437
 CO/CO₂ Analyzer Model : TELEDYNE API 300EM Serial No. : 774
 Serial No. : 451

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
11:30	6.35	4.28	40.98	-	2.47	
11:31	6.27	4.32	41.05	-	2.46	
11:32	6.24	4.32	40.72	-	2.40	
11:33	6.27	4.32	40.42	-	2.47	
11:34	6.35	4.30	40.16	-	2.46	
11:35	6.38	4.27	39.86	-	2.45	
11:36	6.43	4.22	39.69	-	2.42	
11:37	6.49	4.18	39.85	-	2.44	
11:38	6.49	4.20	39.99	-	2.42	
11:39	6.48	4.22	40.00	-	2.40	
11:40	6.46	4.23	40.16	-	2.38	
11:41	6.45	4.23	40.53	-	2.31	
11:42	6.38	4.26	40.67	-	2.35	
11:43	6.38	4.30	40.75	-	2.26	
11:44	6.45	4.26	40.86	-	2.28	
11:45	6.48	4.23	41.08	-	2.21	
11:46	6.50	4.23	41.43	-	2.17	
11:47	6.52	4.20	41.62	-	2.19	
11:48	6.46	4.21	41.73	-	2.10	
11:49	6.40	4.27	41.88	-	2.18	
11:50	6.48	4.26	41.93	-	2.14	
Average	6.41	4.25	40.73	-	2.33	

Sakait P

(Mr.Sakait Phaisanphisut)

Environmental Field Scientist (4)

FORM NO.: F 05-062 REVISION NO.: 2 ISSUE DATE: 3/06/19

ALS Laboratory Group



EMISSION TEST RESULT

Client	Siam Styrene Monomer Co., Ltd.	Run #	2
Date	19 Sep 23	Location	Styrene Furnace
Start Time	11:51	Test Operator	Sakait P.
SO ₂ Analyzer Model	TELEDYNE API 100EH	Finish Time	12:11
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.	437
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.	774
		Serial No.	451

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
11:51	6.56	4.21	42.04	-	2.05	
11:52	6.55	4.21	42.31	-	2.06	
11:53	6.47	4.25	42.38	-	2.08	
11:54	6.48	4.26	42.25	-	2.06	
11:55	6.46	4.26	42.10	-	2.05	
11:56	6.47	4.26	41.88	-	2.03	
11:57	6.46	4.29	41.56	-	2.07	
11:58	6.47	4.27	41.19	-	2.06	
11:59	6.49	4.27	40.95	-	2.05	
12:00	6.49	4.24	40.49	-	2.05	
12:01	6.55	4.22	40.26	-	2.01	
12:02	6.56	4.21	40.17	-	2.04	
12:03	6.54	4.23	40.31	-	2.04	
12:04	6.45	4.25	40.53	-	2.01	
12:05	6.37	4.30	40.66	-	1.96	
12:06	6.48	4.29	40.75	-	1.98	
12:07	6.55	4.23	40.88	-	1.97	
12:08	6.56	4.21	40.94	-	1.89	
12:09	6.52	4.22	41.18	-	1.87	
12:10	6.48	4.26	41.30	-	1.83	
12:11	6.45	4.28	41.45	-	1.81	
Average	6.50	4.24	41.22	-	2.00	

Sakait P.
(Mr.Sakait Phaisanphaut)

Environmental Field Scientist (4)



EMISSION TEST RESULT

Client	Siam Styrene Monomer Co., Ltd.	Run #	3
Date	19 Sep 23	Location	Styrene Furnace
Start Time	12:12	Test Operator	Sakait P.
SO ₂ Analyzer Model	TELEDYNE API 100EH	Finish Time	12:32
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.	437
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.	774
		Serial No.	451

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
12:12	6.44	4.28	41.55	-	1.80	
12:13	6.46	4.28	41.59	-	1.80	
12:14	6.46	4.27	41.74	-	1.78	
12:15	6.45	4.27	41.78	-	1.77	
12:16	6.43	4.29	41.76	-	1.69	
12:17	6.42	4.29	41.70	-	1.72	
12:18	6.42	4.29	41.72	-	1.72	
12:19	6.45	4.29	41.93	-	1.68	
12:20	6.46	4.27	42.16	-	1.70	
12:21	6.51	4.24	42.21	-	1.70	
12:22	6.53	4.23	42.14	-	1.58	
12:23	6.51	4.22	41.89	-	1.71	
12:24	6.50	4.24	41.72	-	1.67	
12:25	6.48	4.24	41.33	-	1.66	
12:26	6.40	4.33	40.92	-	1.66	
12:27	6.45	4.31	40.49	-	1.73	
12:28	6.48	4.27	40.29	-	1.71	
12:29	6.51	4.23	40.18	-	1.72	
12:30	6.49	4.24	40.17	-	1.72	
12:31	6.47	4.27	40.16	-	1.70	
12:32	6.46	4.27	40.08	-	1.66	
Average	6.47	4.26	41.31	-	1.71	

Sakait P.
(Mr.Sakait Phaisanphaut)

Environmental Field Scientist (4)



Lot No. 2321157-1

ANALYZER CALIBRATION DATA

Client : Siam Styrene Monomer Co., Ltd. Location : Styrene Furnace
Date : 19 Sep 23 Test Operator : Saksit P.

O₂ ANALYZER
Model : TELEDYNE API 200EH Serial No. : 774
Span (%) : 25

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	-0.03	-0.01	0.08
Low-Level Gas	7.93	7.90	7.92	0.08
Span Gas	16.00	15.97	15.99	0.08

NO_x ANALYZER
Model : TELEDYNE API 200EH Serial No. : 774
Span (ppm) : 200

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.05	-0.01	0.02
Low-Level Gas	82.39	82.34	82.38	0.02
Span Gas	164.40	164.35	164.39	0.02

CO ANALYZER
Model : TELEDYNE API 300EM Serial No. : 451
Span (ppm) : 500

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.03	-0.01	0.00
Low-Level Gas	79.48	79.45	79.47	0.00
Span Gas	407.40	407.37	407.39	0.00

Calibrated by

(Mr.Saksit Phaisanphisut)

Environmental Field Scientist (4)

FORM NO.: F 06-104 REVISION NO.: - ISSUE DATE: 3/06/19

ALS Laboratory Group



Lot No. 2321157-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Siam Styrene Monomer Co., Ltd. Location : Styrene Furnace
Date : 19 Sep 23 Test Operator : Saksit P.

O₂ ANALYZER
Cylinder Conc. (%) : 16.00 Span (%) : 25

	O ₂ Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.03	-0.03	0.00	-0.01	0.08	0.08
Upscale Gas	15.97	15.97	0.00	15.99	0.08	0.08

NO_x ANALYZER
Cylinder Conc. (ppm) : 164.40 Span (ppm) : 200

	NO _x Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.05	-0.05	0.00	-0.01	0.02	0.02
Upscale Gas	164.35	164.35	0.00	164.39	0.02	0.02

CO ANALYZER
Cylinder Conc. (ppm) : 407.40 Span (ppm) : 500

	CO Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.03	-0.03	0.00	-0.01	0.00	0.00
Upscale Gas	407.37	407.37	0.00	407.39	0.00	0.00

Calibrated by

(Mr.Saksit Phaisanphisut)

Environmental Field Scientist (4)

FORM NO.: F 06-104 REVISION NO.: - ISSUE DATE: 3/06/19

ALS Laboratory Group



CEMs Data

Client Name Siam Styrene Monomer Co., Ltd.
Plant Name SSMC

Date 19 Sep 23
Location Styrene Furnace

Run No: 1 Time Base: 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	11:30	-	51.80	1.81	6.25	-
19 Sep 23	11:31	-	52.00	1.81	6.25	-
19 Sep 23	11:32	-	52.00	1.59	6.32	-
19 Sep 23	11:33	-	52.30	1.60	6.36	-
19 Sep 23	11:34	-	52.40	1.81	6.39	-
19 Sep 23	11:35	-	52.50	1.57	6.31	-
19 Sep 23	11:36	-	52.30	1.58	6.32	-
19 Sep 23	11:37	-	51.90	1.56	6.32	-
19 Sep 23	11:38	-	51.50	1.56	6.28	-
19 Sep 23	11:39	-	51.20	1.55	6.27	-
19 Sep 23	11:40	-	51.00	1.55	6.22	-
19 Sep 23	11:41	-	50.80	1.58	6.25	-
19 Sep 23	11:42	-	50.30	1.53	6.25	-
19 Sep 23	11:43	-	50.00	1.53	6.20	-
19 Sep 23	11:44	-	50.10	1.52	6.15	-
19 Sep 23	11:45	-	50.20	1.51	6.22	-
19 Sep 23	11:46	-	50.60	1.53	6.35	-
19 Sep 23	11:47	-	50.80	1.53	6.37	-
19 Sep 23	11:48	-	50.90	1.56	6.27	-
19 Sep 23	11:49	-	51.10	1.53	6.22	-
19 Sep 23	11:50	-	51.40	1.56	6.22	-
Max		-	52.50	1.81	6.39	-
Avg		-	51.27	1.56	6.26	-

Run No: 3 Time Base: 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	12:12	-	51.40	1.81	6.32	-
19 Sep 23	12:13	-	51.60	1.58	6.24	-
19 Sep 23	12:14	-	51.40	1.58	6.18	-
19 Sep 23	12:15	-	50.90	1.55	6.25	-
19 Sep 23	12:16	-	50.70	1.56	6.26	-
19 Sep 23	12:17	-	50.80	1.53	6.30	-
19 Sep 23	12:18	-	50.90	1.53	6.29	-
19 Sep 23	12:19	-	50.80	1.53	6.26	-
19 Sep 23	12:20	-	51.00	1.51	6.20	-
19 Sep 23	12:21	-	50.90	1.51	6.12	-
19 Sep 23	12:22	-	50.80	1.53	6.23	-
19 Sep 23	12:23	-	51.20	1.54	6.25	-
19 Sep 23	12:24	-	51.20	1.55	6.20	-
19 Sep 23	12:25	-	51.30	1.55	6.11	-
19 Sep 23	12:26	-	51.30	1.57	6.15	-
19 Sep 23	12:27	-	51.50	1.56	6.19	-
19 Sep 23	12:28	-	52.00	1.57	6.21	-
19 Sep 23	12:29	-	51.80	1.58	6.23	-
19 Sep 23	12:30	-	51.50	1.56	6.23	-
19 Sep 23	12:31	-	51.60	1.58	6.26	-
19 Sep 23	12:32	-	51.40	1.55	6.30	-
Max		-	52.00	1.81	6.32	-
Avg		-	51.24	1.55	6.23	-

Run No: 5 Time Base: 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	12:54	-	50.20	1.55	6.14	-
19 Sep 23	12:55	-	50.10	1.53	6.16	-
19 Sep 23	12:56	-	50.40	1.50	6.24	-
19 Sep 23	12:57	-	50.50	1.54	6.27	-
19 Sep 23	12:58	-	51.10	1.56	6.22	-
19 Sep 23	12:59	-	51.10	1.57	6.26	-
19 Sep 23	13:00	-	51.40	1.57	6.21	-
19 Sep 23	13:01	-	51.50	1.56	6.18	-
19 Sep 23	13:02	-	51.70	1.58	6.18	-
19 Sep 23	13:03	-	51.80	1.57	6.16	-
19 Sep 23	13:04	-	51.70	1.57	6.11	-
19 Sep 23	13:05	-	51.60	1.59	6.14	-
19 Sep 23	13:06	-	51.60	1.58	6.22	-
19 Sep 23	13:07	-	51.30	1.57	6.14	-
19 Sep 23	13:08	-	50.70	1.56	6.20	-
19 Sep 23	13:09	-	50.80	1.54	6.28	-
19 Sep 23	13:10	-	50.70	1.54	6.24	-
19 Sep 23	13:11	-	50.30	1.51	6.21	-
19 Sep 23	13:12	-	49.90	1.53	6.19	-
19 Sep 23	13:13	-	50.20	1.52	6.16	-
19 Sep 23	13:14	-	50.50	1.53	6.17	-
Max		-	51.80	1.59	6.28	-
Avg		-	50.91	1.55	6.20	-

Run No: 2 Time Base: 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	11:51	-	51.80	1.54	6.30	-
19 Sep 23	11:52	-	52.10	1.57	6.31	-
19 Sep 23	11:53	-	52.00	1.59	6.28	-
19 Sep 23	11:54	-	51.80	1.57	6.25	-
19 Sep 23	11:55	-	51.50	1.59	6.24	-
19 Sep 23	11:56	-	51.70	1.58	6.21	-
19 Sep 23	11:57	-	51.20	1.57	6.24	-
19 Sep 23	11:58	-	51.20	1.53	6.27	-
19 Sep 23	11:59	-	50.90	1.53	6.24	-
19 Sep 23	12:00	-	50.80	1.52	6.27	-
19 Sep 23	12:01	-	50.70	1.54	6.31	-
19 Sep 23	12:02	-	50.90	1.55	6.40	-
19 Sep 23	12:03	-	50.80	1.53	6.36	-
19 Sep 23	12:04	-	51.00	1.54	6.32	-
19 Sep 23	12:05	-	50.90	1.53	6.25	-
19 Sep 23	12:06	-	50.80	1.57	6.28	-
19 Sep 23	12:07	-	51.00	1.57	6.39	-
19 Sep 23	12:08	-	51.30	1.60	6.41	-
19 Sep 23	12:09	-	51.40	1.60	6.30	-
19 Sep 23	12:10	-	51.60	1.57	6.32	-
19 Sep 23	12:11	-	51.60	1.60	6.31	-
Max		-	52.10	1.60	6.41	-
Avg		-	51.27	1.56	6.30	-

Run No: 4 Time Base: 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	12:33	-	51.40	1.55	6.23	-
19 Sep 23	12:34	-	51.20	1.54	6.29	-
19 Sep 23	12:35	-	51.00	1.55	6.29	-
19 Sep 23	12:36	-	50.70	1.55	6.23	-
19 Sep 23	12:37	-	50.40	1.56	6.20	-
19 Sep 23	12:38	-	50.20	1.58	6.18	-
19 Sep 23	12:39	-	50.20	1.53	6.14	-
19 Sep 23	12:40	-	50.60	1.53	6.20	-
19 Sep 23	12:41	-	51.10	1.57	6.28	-
19 Sep 23	12:42	-	51.40	1.57	6.26	-
19 Sep 23	12:43	-	51.40	1.57	6.22	-
19 Sep 23	12:44	-	51.30	1.55	6.24	-
19 Sep 23	12:45	-	51.40	1.62	6.29	-
19 Sep 23	12:46	-	51.70	1.61	6.25	-
19 Sep 23	12:47	-	51.60	1.58	6.26	-
19 Sep 23	12:48	-	51.30	1.57	6.27	-
19 Sep 23	12:49	-	51.00	1.54	6.15	-
19 Sep 23	12:50	-	51.10	1.53	6.15	-
19 Sep 23	12:51	-	50.90	1.53	6.15	-
19 Sep 23	12:52	-	50.70	1.53	6.19	-
19 Sep 23	12:53	-	50.30	1.54	6.17	-
Max		-	51.70	1.62	6.29	-
Avg		-	51.00	1.56	6.22	-

Run No: 6 Time Base: 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	13:15	-	50.40	1.54	6.14	-
19 Sep 23	13:16	-	50.60	1.55	6.21	-
19 Sep 23	13:17	-	51.10	1.58	6.21	-
19 Sep 23	13:18	-	51.30	1.57	6.27	-
19 Sep 23	13:19	-	51.30	1.54	6.29	-
19 Sep 23	13:20	-	51.70	1.52	6.23	-
19 Sep 23	13:21	-	51.60	1.58	6.24	-
19 Sep 23	13:22	-	51.30	1.59	6.20	-
19 Sep 23	13:23	-	51.20	1.51	6.25	-
19 Sep 23	13:24	-	51.30	1.54	6.28	-
19 Sep 23	13:25	-	51.20	1.54	6.22	-
19 Sep 23	13:26	-	50.90	1.53	6.14	-
19 Sep 23	13:27	-	50.50	1.54	6.22	-
19 Sep 23	13:28	-	50.50	1.53	6.25	-
19 Sep 23	13:29	-	50.80	1.53	6.25	-
19 Sep 23	13:30	-	50.60	1.53	6.28	-
19 Sep 23	13:31	-	50.80	1.50	6.28	-
19 Sep 23	13:32	-	50.80	1.53	6.22	-
19 Sep 23	13:33	-	50.90	1.54	6.22	-
19 Sep 23	13:34	-	51.40	1.55	6.21	-
19 Sep 23	13:35	-	51.60	1.54	6.14	-
Max		-	51.70	1.59	6.29	-
Avg		-	51.04	1.56	6.23	-



CEMs Data

Client Name Siam Styrene Monomer Co., Ltd.
Plant Name SSMC

Date 19 Sep 23
Location Styrene Furnace

Run No: 7 Time Base: 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	13:36	-	51.50	1.52	6.17	-
19 Sep 23	13:37	-	51.70	1.54	6.18	-
19 Sep 23	13:38	-	51.80	1.53	6.19	-
19 Sep 23	13:39	-	51.70	1.53	6.21	-
19 Sep 23	13:40	-	51.70	1.54	6.20	-
19 Sep 23	13:41	-	51.40	1.54	6.18	-
19 Sep 23	13:42	-	51.20	1.59	6.19	-
19 Sep 23	13:43	-	51.00	1.52	6.19	-
19 Sep 23	13:44	-	50.80	1.54	6.21	-
19 Sep 23	13:45	-	50.50	1.54	6.23	-
19 Sep 23	13:46	-	50.70	1.51	6.29	-
19 Sep 23	13:47	-	50.70	1.52	6.25	-
19 Sep 23	13:48	-	51.00	1.54	6.27	-
19 Sep 23	13:49	-	51.40	1.56	6.28	-
19 Sep 23	13:50	-	51.20	1.56	6.28	-
19 Sep 23	13:51	-	51.40	1.58	6.26	-
19 Sep 23	13:52	-	51.60	1.58	6.20	-
19 Sep 23	13:53	-	51.80	1.56	6.26	-
19 Sep 23	13:54	-	52.00	1.55	6.29	-
19 Sep 23	13:55	-	52.20	1.55	6.27	-
19 Sep 23	13:56	-	51.90	1.58	6.27	-
Max		-	52.20	1.59	6.29	-
Avg		-	51.40	1.55	6.23	-

Run No: 9 Time Base: 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	14:18	-	51.50	1.54	6.13	-
19 Sep 23	14:19	-	51.20	1.54	6.22	-
19 Sep 23	14:20	-	51.10	1.55	6.15	-
19 Sep 23	14:21	-	51.00	1.55	6.18	-
19 Sep 23	14:22	-	50.90	1.50	6.20	-
19 Sep 23	14:23	-	51.20	1.56	6.22	-
19 Sep 23	14:24	-	51.50	1.57	6.21	-
19 Sep 23	14:25	-	52.00	1.60	6.23	-
19 Sep 23	14:26	-	51.80	1.57	6.21	-
19 Sep 23	14:27	-	52.30	1.52	6.21	-
19 Sep 23	14:28	-	52.10	1.56	6.17	-
19 Sep 23	14:29	-	52.40	1.56	6.21	-
19 Sep 23	14:30	-	52.20	1.60	6.23	-
19 Sep 23	14:31	-	52.30	1.56	6.13	-
19 Sep 23	14:32	-	52.20	1.55	6.16	-
19 Sep 23	14:33	-	51.70	1.53	6.18	-
19 Sep 23	14:34	-	51.80	1.56	6.27	-
19 Sep 23	14:35	-	51.90	1.54	6.20	-
19 Sep 23	14:36	-	51.40	1.57	6.17	-
19 Sep 23	14:37	-	51.10	1.56	6.19	-
19 Sep 23	14:38	-	50.90	1.53	6.11	-
Max		-	52.40	1.60	6.27	-
Avg		-	51.64	1.55	6.19	-



Reference Method Data

Client Name Siam Styrene Monomer Co., Ltd.

Date 19 Sep 23

Plant Name SSMC

Location Styrene Furnace

Run No: 1 Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	11:30	-	40.98	2.47	6.35	4.28
19 Sep 23	11:31	-	41.05	2.46	6.27	4.32
19 Sep 23	11:32	-	40.72	2.40	6.24	4.32
19 Sep 23	11:33	-	40.42	2.47	6.27	4.32
19 Sep 23	11:34	-	40.16	2.46	6.35	4.30
19 Sep 23	11:35	-	39.86	2.45	6.38	4.27
19 Sep 23	11:36	-	39.69	2.42	6.43	4.22
19 Sep 23	11:37	-	39.85	2.44	6.49	4.18
19 Sep 23	11:38	-	39.99	2.42	6.49	4.20
19 Sep 23	11:39	-	40.00	2.40	6.48	4.22
19 Sep 23	11:40	-	40.16	2.38	6.46	4.23
19 Sep 23	11:41	-	40.53	2.31	6.45	4.23
19 Sep 23	11:42	-	40.67	2.35	6.38	4.26
19 Sep 23	11:43	-	40.75	2.26	6.38	4.26
19 Sep 23	11:44	-	40.65	2.28	6.45	4.26
19 Sep 23	11:45	-	41.08	2.21	6.48	4.23
19 Sep 23	11:46	-	41.43	2.17	6.50	4.23
19 Sep 23	11:47	-	41.62	2.19	6.52	4.20
19 Sep 23	11:48	-	41.73	2.10	6.46	4.21
19 Sep 23	11:49	-	41.88	2.18	6.40	4.27
19 Sep 23	11:50	-	41.93	2.14	6.48	4.26
Max	-	-	41.93	2.47	6.52	4.32
Avg	-	-	40.73	2.33	6.41	4.25

Run No: 3 Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	12:12	-	41.55	1.80	6.44	4.28
19 Sep 23	12:13	-	41.59	1.80	6.46	4.28
19 Sep 23	12:14	-	41.74	1.78	6.46	4.27
19 Sep 23	12:15	-	41.78	1.77	6.45	4.27
19 Sep 23	12:16	-	41.76	1.69	6.43	4.29
19 Sep 23	12:17	-	41.70	1.72	6.42	4.29
19 Sep 23	12:18	-	41.72	1.72	6.42	4.29
19 Sep 23	12:19	-	41.93	1.68	6.45	4.29
19 Sep 23	12:20	-	42.16	1.70	6.46	4.27
19 Sep 23	12:21	-	42.21	1.70	6.51	4.24
19 Sep 23	12:22	-	42.14	1.68	6.52	4.23
19 Sep 23	12:23	-	41.89	1.71	6.51	4.22
19 Sep 23	12:24	-	41.72	1.67	6.50	4.24
19 Sep 23	12:25	-	41.33	1.66	6.48	4.24
19 Sep 23	12:26	-	40.92	1.66	6.40	4.33
19 Sep 23	12:27	-	40.40	1.73	6.45	4.31
19 Sep 23	12:28	-	40.29	1.71	6.48	4.27
19 Sep 23	12:29	-	40.18	1.72	6.51	4.23
19 Sep 23	12:30	-	40.17	1.72	6.49	4.24
19 Sep 23	12:31	-	40.16	1.70	6.47	4.27
19 Sep 23	12:32	-	40.08	1.66	6.46	4.27
Max	-	-	42.21	1.80	6.53	4.33
Avg	-	-	41.31	1.71	6.47	4.26

Run No: 5 Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	12:54	-	40.05	1.53	6.31	4.32
19 Sep 23	12:55	-	39.73	1.47	6.29	4.35
19 Sep 23	12:56	-	39.49	1.52	6.31	4.34
19 Sep 23	12:57	-	39.40	1.47	6.41	4.31
19 Sep 23	12:58	-	39.75	1.55	6.50	4.28
19 Sep 23	12:59	-	40.20	1.48	6.51	4.26
19 Sep 23	13:00	-	40.41	1.46	6.49	4.26
19 Sep 23	13:01	-	40.62	1.44	6.47	4.29
19 Sep 23	13:02	-	40.66	1.46	6.41	4.31
19 Sep 23	13:03	-	41.16	1.45	6.34	4.38
19 Sep 23	13:04	-	41.35	1.41	6.45	4.35
19 Sep 23	13:05	-	41.40	1.46	6.50	4.28
19 Sep 23	13:06	-	41.25	1.41	6.47	4.28
19 Sep 23	13:07	-	41.20	1.43	6.42	4.29
19 Sep 23	13:08	-	41.05	1.41	6.41	4.32
19 Sep 23	13:09	-	40.81	1.42	6.40	4.33
19 Sep 23	13:10	-	40.60	1.38	6.35	4.35
19 Sep 23	13:11	-	40.42	1.43	6.36	4.33
19 Sep 23	13:12	-	40.15	1.43	6.39	4.30
19 Sep 23	13:13	-	39.96	1.45	6.40	4.31
19 Sep 23	13:14	-	39.98	1.45	6.39	4.31
Max	-	-	41.40	1.55	6.51	4.38
Avg	-	-	40.47	1.45	6.41	4.31

Run No: 6 Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	13:15	-	40.07	1.42	6.42	4.30
19 Sep 23	13:16	-	40.04	1.44	6.46	4.28
19 Sep 23	13:17	-	40.05	1.40	6.53	4.23
19 Sep 23	13:18	-	40.21	1.48	6.44	4.24
19 Sep 23	13:19	-	40.45	1.36	6.39	4.30
19 Sep 23	13:20	-	40.86	1.37	6.36	4.32
19 Sep 23	13:21	-	41.24	1.36	6.43	4.29
19 Sep 23	13:22	-	41.49	1.35	6.48	4.26
19 Sep 23	13:23	-	41.57	1.37	6.43	4.26
19 Sep 23	13:24	-	41.49	1.28	6.35	4.32
19 Sep 23	13:25	-	41.29	1.33	6.31	4.34
19 Sep 23	13:26	-	40.98	1.37	6.24	4.34
19 Sep 23	13:27	-	40.74	1.42	6.40	4.30
19 Sep 23	13:28	-	40.53	1.36	6.39	4.28
19 Sep 23	13:29	-	40.31	1.36	6.34	4.29
19 Sep 23	13:30	-	39.97	1.39	6.26	4.36
19 Sep 23	13:31	-	39.64	1.41	6.21	4.40
19 Sep 23	13:32	-	39.08	1.42	6.28	4.36
19 Sep 23	13:33	-	38.87	1.36	6.30	4.31
19 Sep 23	13:34	-	38.74	1.39	6.30	4.32
19 Sep 23	13:35	-	38.72	1.31	6.26	4.34
Max	-	-	41.57	1.46	6.53	4.40
Avg	-	-	40.30	1.38	6.37	4.39



Reference Method Data

Client Name Siam Styrene Monomer Co., Ltd.

Date 19 Sep 23

Plant Name SSMC

Location Styrene Furnace

Run No: 7 Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	13:36	-	38.99	1.41	6.23	4.34
19 Sep 23	13:37	-	39.28	1.35	6.24	4.35
19 Sep 23	13:38	-	39.59	1.32	6.25	4.36
19 Sep 23	13:39	-	39.87	1.32	6.26	4.34
19 Sep 23	13:40	-	40.15	1.36	6.29	4.32
19 Sep 23	13:41	-	40.15	1.34	6.28	4.33
19 Sep 23	13:42	-	40.15	1.31	6.32	4.31
19 Sep 23	13:43	-	40.13	1.33	6.30	4.32
19 Sep 23	13:44	-	40.08	1.30	6.32	4.30
19 Sep 23	13:45	-	39.85	1.31	6.34	4.29
19 Sep 23	13:46	-	39.53	1.28	6.33	4.29
19 Sep 23	13:47	-	39.40	1.28	6.36	4.29
19 Sep 23	13:48	-	39.15	1.30	6.38	4.28
19 Sep 23	13:49	-	38.96	1.32	6.38	4.29
19 Sep 23	13:50	-	38.82	1.25	6.34	4.30
19 Sep 23	13:51	-	38.79	1.28	6.30	4.31
19 Sep 23	13:52	-	38.69	1.28	6.26	4.35
19 Sep 23	13:53	-	38.74	1.31	6.29	4.34
19 Sep 23	13:54	-	38.83	1.22	6.28	4.35
19 Sep 23	13:55	-	39.13	1.28	6.26	4.35
19 Sep 23	13:56	-	39.25	1.28	6.29	4.34
Max	-	-	40.15	1.41	6.38	4.36
Avg	-	-	39.41	1.31	6.30	4.32

Run No: 9 Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	14:18	-	40.77	1.12	6.34	4.30
19 Sep 23	14:19	-	40.87	1.12	6.40	4.29
19 Sep 23	14:20	-	40.47	1.12	6.41	4.27
19 Sep 23	14:21	-	40.22	1.18	6.37	4.29
19 Sep 23	14:22	-	40.11	1.07	6.40	4.29
19 Sep 23	14:23	-	40.01	1.17	6.36	4.30
19 Sep 23	14:24	-	39.78	1.21	6.35	4.32
19 Sep 23	14:25	-	39.42	1.13	6.35	4.31
19 Sep 23	14:26	-	39.02	1.18	6.35	4.29
19 Sep 23	14:27	-	38.70	1.16	6.30	4.32
19 Sep 23	14:28	-	38.66	1.13	6.33	4.32
19 Sep 23	14:29	-	38.84	1.16	6.35	4.31
19 Sep 23	14:30	-	38.11	1.15	6.22	4.31
19 Sep 23	14:31	-	39.25	1.19	6.37	4.30
19 Sep 23	14:32	-	38.73	1.07	6.35	4.31
19 Sep 23	14:33	-	39.97	1.06	6.34	4.31
19 Sep 23	14:34	-	40.25	1.02	6.35	4.31
19 Sep 23	14:35	-	40.55	1.01	6.33	4.33
19 Sep 23	14:36	-	40.75	1.06	6.39	4.29
19 Sep 23	14:37	-	40.85	1.05	6.40	4.27
19 Sep 23	14:38	-	40.91	1.01	6.39	4.28
Max	-	-	40.91	1.21	6.41	4.33
Avg	-	-	39.51	1.11	6.36	4.30

Run No: 11 Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
19 Sep 23	15:00	-	40.34	1.02	6.31	4.31
19 Sep 23	15:01	-	39.88	1.01	6.29	4.33
19 Sep 23	15:02	-	39.45	1.01	6.30	4.32
19 Sep 23	15:03	-	39.31	1.04	6.31	4.32
19 Sep 23	15:04	-	39.21	1.01	6.29	4.31
19 Sep 23	15:05	-	39.23	1.00	6.29	4.31
19 Sep 23	15:06	-	39.45	1.01	6.29	4.31
19 Sep 23	15:07	-	39.72	1.02	6.30	4.31
19 Sep 23	15:08	-	40.03	1.00	6.27	4.30
19 Sep 23	15:09	-	40.24	0.98	6.25	4.31
19 Sep 23	15:10	-	40.51	0.95	6.28	4.32
19 Sep 23	15:11	-	40.74	0.96	6.32	4.31
19 Sep 23	15:12	-	41.05	0.89	6.30	4.32
19 Sep 23	15:13	-	41.25	0.97	6.30	4.33
19 Sep 23	15:14	-	41.36	0.97	6.28	4.32
19 Sep 23	15:15	-	41.27	0.86	6.36	4.31
19 Sep 23	15:16	-	41.29	0.88	6.38	4.28
19 Sep 23	15:17	-	41.41	0.91	6.40	4.27
19 Sep 23	15:18	-	41.45	0.86	6.40	4.27
19 Sep 23	15:19	-	41.46	0.81	6.38	4.28
19 Sep 23	15:20	-	41.49	0.83	6.37	4.29
Max	-	-	41.49	1.04	6.40	4.33
Avg	-	-	40.49	0.95	6.32	4.30

Run No: 12 Time Base : 21 min

Date	Time	SO2 ppm	NOx
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CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Customer: AIR LIQUIDE
(THAILAND) LTD
Part Number: E04NI99E3HA0002
Cylinder Number: GN0027210
Laboratory: 124 - Plumsteadville - PA
PGVP Number: A12022
Gas Code: CO,NO,NOX,SO2,BALN

Reference Number: 160-402340013-1
Cylinder Volume: 247.2 CF
Cylinder Pressure: 2215 PSIG
Valve Outlet: 660
Certification Date: Feb 11, 2022

Expiration Date: Feb 11, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	80.00 PPM	82.39 PPM	G1	+/- 1.0% NIST Traceable	02/04/2022, 02/11/2022
CARBON MONOXIDE	80.00 PPM	79.48 PPM	G1	+/- 0.6% NIST Traceable	02/04/2022, 02/11/2022
NITRIC OXIDE	80.00 PPM	82.38 PPM	G1	+/- 1.0% NIST Traceable	02/04/2022, 02/11/2022
SULFUR DIOXIDE	80.00 PPM	78.75 PPM	G1	+/- 0.9% NIST Traceable	02/04/2022, 02/11/2022
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	09010212	KAL004777	98.48 PPM CARBON MONOXIDE/NITROGEN	+/- 0.5%	Oct 16, 2024
NTRM	200610-15	CC733106	98.61 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%	Oct 06, 2026
NTRM	200610-04	CC708044	98.61 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%	Oct 06, 2026
GMIS	124206889139	CC323707	4.097 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Sep 03, 2024
NTRM	11010419	KAL004813	99.6 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Jul 28, 2023

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet IS50 FTIR AUP2010245 CO	FTIR	Feb 03, 2022
Nicolet IS50 FTIR AUP2010245 NO	FTIR	Feb 10, 2022
Nicolet IS50 FTIR AUP2010245 NO2	FTIR	Jan 27, 2022
Nicolet IS50 FTIR AUP2010245 SO2	FTIR	Jan 20, 2022

Triad Data Available Upon Request

NOTES: Gross Weight: 48.5 Kg
Net Weight: 8.1 Kg



CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E04NI99E15A021C
Cylinder Number: CC709609
Laboratory: 124 - Plumsteadville - PA
PGVP Number: A12021
Gas Code: CO,NO,NOX,SO2,BALN

Reference Number: 160-402020199-1
Cylinder Volume: 144.4 CF
Cylinder Pressure: 2015 PSIG
Valve Outlet: 660
Certification Date: Feb 22, 2021

Expiration Date: Feb 22, 2029

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	55.00 PPM	54.96 PPM	G1	+/- 1.4% NIST Traceable	02/15/2021, 02/22/2021
CARBON MONOXIDE	55.00 PPM	54.84 PPM	G1	+/- 0.7% NIST Traceable	02/15/2021
NITRIC OXIDE	55.00 PPM	54.69 PPM	G1	+/- 1.1% NIST Traceable	02/15/2021, 02/22/2021
SULFUR DIOXIDE	55.00 PPM	55.55 PPM	G1	+/- 1.0% NIST Traceable	02/15/2021, 02/22/2021
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	14060753	CC434455	49.88 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	Feb 13, 2026
PRM	12386	D685025	9.91 PPM AIR/NITROGEN DIOXIDE	2.0%	Feb 20, 2020
NTRM	200611-04	CC707968	49.82 PPM NITRIC OXIDE/NITROGEN	+/- 1.0%	Feb 02, 2025
GMIS	124206889	CC323707	4.028 PPM NITROGEN DIOXIDE/NITROGEN	2.1%	Aug 15, 2021
NTRM	0141709	KAL003190	49.67 PPM SULFUR DIOXIDE/NITROGEN	+/- 1.0%	Jun 20, 2022

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

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet IS50 FTIR AUP2010245 CO	FTIR	Feb 04, 2021
Nicolet IS50 FTIR AUP2010245 NO	FTIR	Feb 11, 2021
Nicolet IS50 FTIR AUP2010245 NO2	FTIR	Feb 22, 2021
Nicolet IS50 FTIR AUP2010245 SO2	FTIR	Feb 18, 2021

Triad Data Available Upon Request

NOTES:
Gross Weight: 28.8 Kg
Net Weight: 4.8 Kg



Michael A. Huber
Approved for Release

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E04NI99E3HA0002 Reference Number: 82-401257890-1
Cylinder Number: ND62877 Cylinder Volume: 247.2 CF
Laboratory: 124 - Riverton (SAP) - NJ Cylinder Pressure: 2215 PSIG
PGVP Number: B52018 Valve Outlet: 660
Gas Code: CO,NO,NOX,SO2,BALN Certification Date: Aug 07, 2018

Expiration Date: Aug 07, 2026

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	160.0 PPM	164.4 PPM	G1	+/- 1.1% NIST Traceable	07/30/2018, 08/07/2018
NITRIC OXIDE	160.0 PPM	164.4 PPM	G1	+/- 1.1% NIST Traceable	07/30/2018, 08/07/2018
SULFUR DIOXIDE	160.0 PPM	159.9 PPM	G1	+/- 1.1% NIST Traceable	07/30/2018, 08/07/2018
CARBON MONOXIDE	400.0 PPM	407.4 PPM	G1	+/- 1.1% NIST Traceable	07/30/2018
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	17060241	EB0079587	100.3 PPM NITRIC OXIDE/NITROGEN	+/- 1.0%	May 11, 2019
PRM	12368	5604119	29.86 PPM NITROGEN DIOXIDE/AIR	+/- 1.5%	Jun 02, 2017
GMIS	7042010104	CC503941	5.101 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Jun 01, 2020
NTRM	11010414	KAL004792	99.6 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Jul 28, 2023
NTRM	15060538	CC453507	491.9 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	Jan 08, 2021

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

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 APW1100391 CO	FTIR	Jul 19, 2018
Nicolet 6700 APW1100391 NO	FTIR	Jul 12, 2018
Nicolet 6700 APW1100391 NO2	FTIR	Aug 03, 2018
Nicolet 6700 APW1100391 SO2	FTIR	Aug 02, 2018

Triad Data Available Upon Request

NOTES:

Net weight: 8107 grams
Gross weight: 47690 grams

This calibration std. has been certified in accordance with the May 2012 EPA Traceability Document EPA-600/R-12/531. All testing processes and measurements conform to the ISO/IEC 17025 and to Airgas ISO 9001:2008 and relate only to items identified on this certificate. All items are certified to be NIST Traceable with total uncertainty as detailed under Analytical Uncertainty. This document shall not be reproduced in full without written approval of the issuer.



TESTING CERT No. 3082.05

[Signature]
Approved for Release

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E04NI99E3HA0002 Reference Number: 160-402138465-1
Cylinder Number: ND11222 Cylinder Volume: 247.2 Cubic Feet
Laboratory: 124 - Plumsteadville - PA Cylinder Pressure: 2215 PSIG
PGVP Number: A12021 Valve Outlet: 660
Gas Code: CO,NO,NOX,SO2,BALN Certification Date: Jul 15, 2021

Expiration Date: Jul 15, 2029

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	80.00 PPM	82.51 PPM	G1	+/- 1.4% NIST Traceable	07/08/2021, 07/15/2021
CARBON MONOXIDE	80.00 PPM	79.74 PPM	G1	+/- 0.5% NIST Traceable	07/08/2021
NITRIC OXIDE	80.00 PPM	82.51 PPM	G1	+/- 1.4% NIST Traceable	07/08/2021, 07/15/2021
SULFUR DIOXIDE	80.00 PPM	79.76 PPM	G1	+/- 1.0% NIST Traceable	07/08/2021, 07/15/2021
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	11010130	KAL004538	97.31 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%	Oct 04, 2022
PRM	12386	D685025	9.91 PPM AIR/NITROGEN DIOXIDE	2.0%	Feb 20, 2020
NTRM	200610-50	CC733426	98.61 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%	Oct 06, 2026
GMIS	124206889	CC323707	4.028 PPM NITROGEN DIOXIDE/NITROGEN	2.1%	Aug 15, 2021
NTRM	16010224	KAL003838	97.69 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Dec 23, 2021

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

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet IS50 FTIR AUP2010245 CO	FTIR	Jun 24, 2021
Nicolet IS50 FTIR AUP2010245 NO	FTIR	Jul 01, 2021
Nicolet IS50 FTIR AUP2010245 NO2	FTIR	Jun 30, 2021
Nicolet IS50 FTIR AUP2010245 SO2	FTIR	Jul 09, 2021

Triad Data Available Upon Request

NOTES:

Gross Weight: 48.0 Kg
Net Weight: 7.8 Kg



[Signature]
Approved for Release

CERTIFICATE OF ANALYSIS

Customer Detail:

ALS Laboratory Group (Thailand)

Production Order Number: 90145553

Material Number: 478100-J-44

Certification Date: 07-Dec-2017

Expiry Date: 07-Dec-2025

Cylinder Description

STEEL 47 L

The measurement of this reference material is traceable to SI through a reference standard which is traceable to NIST Standard Reference Material. The assay of this standard has been performed in accordance with the EPA Traceability Protocol EPA-890-R-12-011 for the Assay and Certification of Gaseous Calibration Standards using procedure C1. The results are expressed on a mole-mole basis, unless otherwise specified. The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k=2, providing a level of confidence of approximately 95%.

Certificate Number:

3982/17

Analyst:

Anissara T.

ANISSARA THONGNURI

Cylinder Number:

14465

Approve:

SUKANYA KAMITHARAT

Nominal Cylinder Content:

6.520 M³

Nominal Pressure:

145.0 Bar

Valve Outlet:

CGA 590 BRASS

To Re-Order Please Quote:

478100-J-44

Comment:

- It is recommended that this product be not used below 5% of actual contents or should not be used when its gas pressure is below 150psig
- Other impurities that detect by analytical condition of this mixture shall be report if it is more than 10% of minimum minor component
- Keep and use in well-ventilated and secure area

CERTIFICATE OF ANALYSIS

Analytical Result

Component	Request Concentration	Certified Concentration	Certified Uncertainty	Method	Assay Date
Oxygen	8.00 %	8.04 %	± 1% relative	(2) 1-PB-354	04-Dec-2017
In Nitrogen					

Reference Standard used in Assay

Reference Standard	Cylinder No.	Concentration	Expired Date
Oxygen	113553SG	9.976± 0.02 %	26-Mar-2018
In Nitrogen			

Analytical Instruments used in Assay

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Servomex 4100 O2 Analyzer	Paramagnetic	04-Dec-2017

Method of Analysis

1. Gas Chromatograph
2. Paramagnetic Oxygen Analyser
3. Electrochemical Oxygen Analyser
4. Electrochemical Moisture Analyser
5. Total Hydrocarbon Analyser
6. Other specified

Cylinder Number 14465
Production Order Number 90145553

Certification Date: 07-Dec-2017
Expiration Date: 07-Dec-2025

CERTIFICATE OF ANALYSIS

Customer Detail: ALS Laboratory Group (Thailand)		Production Order Number: 90145554 Material Number: 557200-J-44 Certification Date: 07-Dec-2017 Expiry Date: 07-Dec-2025	
Cylinder Description: STEEL 47 L			
The measurement of this reference material is traceable to SI through Mass. The Assay of this Standard has been performed in accordance with EPA Traceability Protocol EPA-600/R-12-531 for the Assay and results are expressed on a mole/mole basis, unless otherwise specified. The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k=2, providing a level of confidence of approximately 95%.			
Certificate Number: 3977/17	Analyst: ARISSARA THONGNURI		
Cylinder Number: 94892	Approve: SUKANYA KAMUTHARAT		
Nominal Cylinder Content: 6.560 M³	To Re-Order Please Quote: 557200-J-44		
Nominal Pressure: 145.0 Bar			
Valve Outlet: CGA 590 BRASS			
Comment:	<ul style="list-style-type: none"> It is recommended that this product be not used below 5% of actual contents or should not be used when its gas pressure is below 150psig. Other impurities that detect by analytical condition of this mixture shall be report if it is more than 10% of minimum minor component. Keep and use in well-ventilated and secure area. 		

CERTIFICATE OF ANALYSIS

Analytical Result					
Component	Request Concentration	Certified Concentration	Certified Uncertainty	Method	Assay Date
Oxygen In Nitrogen	16.0 %	16.0 %	± 1% relative	(2) I-PB-354	04-Dec-2017
Reference Standard used in Assay					
Reference Standard	Cylinder No.	Concentration	Expired Date		
Oxygen In Nitrogen	113553SG	9.976± 0.02 %	26-Mar-2018		
Analytical Instruments used in Assay					
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration			
Servomex 4100 O2 Analyzer	Paramagnetic	04-Dec-2017			
Method of Analysis 1. Gas Chromatograph 2. Paramagnetic Oxygen Analyser 3. Electrochemical Oxygen Analyser 4. Electrochemical Moisture Analyser 5. Total Hydrocarbon Analyser 6. Other specified					
Cylinder Number 94892 Production Order Number 90145554			Certification Date: 07-Dec-2017 Expiration Date: 07-Dec-2025		

CERTIFICATE OF ANALYSIS

Customer Detail:

ALS Laboratory Group (Thailand)

Production Order Number: 90132928

Material Number: 478100-J-44

Certification Date: 20-Jan-2016

Expiry Date: 20-Jan-2024

Cylinder Description:

Steel 47 L

The measurement of this reference material is traceable to SI through the reference standard which is traceable to Swiss National Standard of Mass. The Assay of this Standard has been performed in accordance with the IFA Traceability Protocol EPA-400/12/5/3 for the Assay and Certification of Gaseous Calibration Standards using procedure G1. The results are expressed on a mole/mole basis, unless otherwise specified. The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k=2, providing a level of confidence of approximately 95%.

Certificate Number:

4676/15

Analyst:


 THITIRAT LOYRAT

Cylinder Number:

S50730

Nominal Cylinder Content:

6.520 M³

Approve:


 SUKANYA KAMUTHARAT

Nominal Pressure:

145.0 Bar

Valve Outlet:

CGA 590 BRASS

To Re-Order Please Quote:

478100-J-44

Comment:

- It is recommended that this product be not used below 5% of actual contents or should not be used when its gas pressure is below 150psig.
- Other impurities that detect by analytical condition of this mixture shall be report if it is more than 10% of minimum minor component.
- Keep and use in well-ventilated and secure area.

CERTIFICATE OF ANALYSIS

Analytical Result

Component	Request Concentration	Certified Concentration	Certified Uncertainty	Method	Assay Date
Oxygen in Nitrogen	8.00 %	7.93 %	±1% relative	(2) I-PB-354	20-Jan-2015

Reference Standard used in Assay

Reference Standard	Cylinder No.	Concentration	Expired Date
Oxygen in Nitrogen	24362SSG	25.08 ± 0.13 %	19-Aug-2017

Analytical Instruments used in Assay

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Servomex 4100 O2 Analyzer	Paramagnetic	23-Dec-2015

Method of Analysis

- Gas Chromatograph
- Paramagnetic Oxygen Analyser
- Electrochemical Oxygen Analyser
- Electrochemical Moisture Analyser
- Total Hydrocarbon Analyser
- Other specified

Cylinder Number: S50730
 Production Order Number: 90132928

Certification Date: 20-Jan-2016
 Expiration Date: 20-Jan-2024

CERTIFICATE OF ANALYSIS

Customer Detail: ALS Laboratory Group (Thailand)		Production Order Number: 90137389 Material Number: 557200-J-44 Certification Date: 24-Sep-2016 Expiry Date: 24-Sep-2024	
Cylinder Description: STEEL 47 L			
The measurement of this reference material is traceable to SI through Mass. The Assay of this Standard has been performed in accordance with the EPA Traceability Protocol EPA-600/R-12/531 for the Assay and the results are expressed on a mole/mole basis, unless otherwise specified. The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k=2, providing a level of confidence of approximately 95%.			
Certificate Number: 2857/16	Analyst: <i>Thit</i> THITIRAT LOYRAT		
Cylinder Number: 363075			
Nominal Cylinder Content: 6.560 M³	Approve: <i>Sukanya</i> SUKANYA KAMUTHARAT		
Nominal Pressure: 145.0 Bar			
Valve Outlet: CGA 590 BRASS	To Re-Order Please Quote: 557200-J-44		
Comment:	<ul style="list-style-type: none"> It is recommended that this product be not used below 5% of actual contents or should not be used when its gas pressure is below 150psig. Other impurities that detect by analytical condition of this mixture shall be report if it is more than 10% of minimum minor component. Keep and use in well-ventilated and secure area. 		

CERTIFICATE OF ANALYSIS

Analytical Result					
Component	Request Concentration	Certified Concentration	Certified Uncertainty	Method	Assay Date
Oxygen in Nitrogen	16.0 %	16.0 %	+/- 1% relative	(2) I-PB-354	24-Sep-2016
Reference Standard used in Assay					
Reference Standard	Cylinder No.	Concentration	Expired Date		
Oxygen in Nitrogen	243625SG	25.98 ± 0.13 %	19-Aug-2017		
Analytical Instruments used in Assay					
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration			
Servomex 4100 O2 Analyzer	Paramagnetic	24-Sep-2016			
Method of Analysis 1. Gas Chromatograph 2. Paramagnetic Oxygen Analyser 3. Electrochemical Oxygen Analyser 4. Electrochemical Moisture Analyser 5. Total Hydrocarbon Analyser 6. Other specified					
Cylinder Number 363075 Production Order Number 90137389			Certification Date: 24-Sep-2016 Expiration Date: 24-Sep-2024		

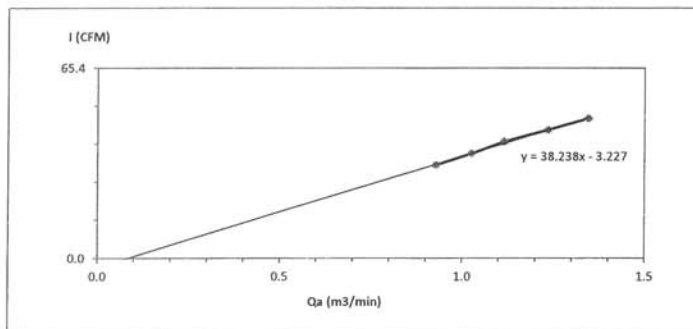


High Volume Air Sampler Calibration Worksheet

Project Site : Siam Styrene Monomer Co., Ltd.
 Calibrate Location : บ้านฉางประจักษ์ (โรงพยาบาลส่งเสริมสุขภาพตำบลฉางประจักษ์)
 Calibrate Date : 14-Sep-23
 CalibrationSheet No.: C-140923-RYG_FS0186
 Calibrator ID: RYG_FS0206
 Calibrator Model: TE-5028A
 Calibrator S/N: 1543

Barometric Pressure (mm Hg) : 756
 Temperature (°C) : 30
 High Volume ID : RYG_FS0186
 High Volume Model : TE-5009X
 High Volume S/N : 4794
 Calibrator Slope : 0.92345
 Calibrator Intercept : -0.0095

Test No.	Delta H ₂ O (inch)	Qa (m ³ /min)	I : Chart (CFM)	Linear Regression
1	1.8	0.929	32	Slope : 38.2381 Intercept : -3.2270 Correlation Coefficient : 0.9984
2	2.2	1.026	36	
3	2.6	1.115	40	
4	3.2	1.236	44	
5	3.8	1.346	48	



Calibrated by sitpawit.s
 (Mr. Sitpawit Suwannarat)
 Field Scientist(1)

Approved by : [Signature]
 (Mr. Noppong Juntarupan)
 Enviro Field Coordinator Scientist (3)

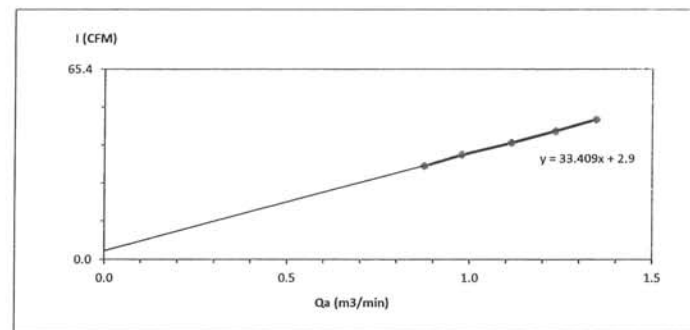


High Volume Air Sampler Calibration Worksheet

Project Site : Siam Styrene Monomer Co., Ltd.
 Calibrate Location : บ้านฉางประจักษ์
 Calibrate Date : 14-Sep-23
 CalibrationSheet No.: C-140923-RYG_FS0665
 Calibrator ID: RYG_FS0206
 Calibrator Model: TE-5028A
 Calibrator S/N: 1543

Barometric Pressure (mm Hg) : 756
 Temperature (°C) : 30
 High Volume ID : RYG_FS0665
 High Volume Model : TE-5009X
 High Volume S/N : 6264
 Calibrator Slope : 0.92345
 Calibrator Intercept : -0.0095

Test No.	Delta H ₂ O (inch)	Qa (m ³ /min)	I : Chart (CFM)	Linear Regression
1	1.6	0.877	32	Slope : 33.4089 Intercept : 2.9000 Correlation Coefficient : 0.9992
2	2.0	0.979	36	
3	2.6	1.115	40	
4	3.2	1.236	44	
5	3.8	1.346	48	



Calibrated by sitpawit.s
 (Mr. Sitpawit Suwannarat)
 Field Scientist(1)

Approved by : [Signature]
 (Mr. Noppong Juntarupan)
 Enviro Field Coordinator Scientist (3)

RYG_EN0001

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6, e-mail: service.thailand@sartorius.com



SARTORIUS

REVIEW BY *Thailand*
APPROVED BY *D. [Signature]*
NEXT CAL DATE *01/03/24*

Certificate of Calibration

Model Number : LA130S-F
Description : Analytical Balance
Serial Number : 25409664
ID No. : RYG_EN0001
Manufacturer : Sartorius

Certificate No. : 23BCI0110
Issued Date : Friday, March 03, 2023
Reference No. : 204833
Page No. : 1 of 2

Customer Name : ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu, A.Pluk Daeng, Rayong 21140, Thailand.

Calibrated Place : ALS Laboratory Group (Thailand) Co., Ltd.(Balance Room)
616/10 Moo 5 T.Maenam Khu, A.Pluk Daeng, Rayong 21140, Thailand.

Calibrated By : Mr.Chonchai Inthana
Calibration Date : Wednesday, March 01, 2023

Calibration Procedure No. : This calibration was conducted by
Using in-house calibration procedure number (WI-003)
Based on UKAS LAB 14 : 2019

Metrological data :
Capacity : 150 g Readability : 0.0001 g
Temperature : 24.2 °C ± 5.0 °C
Humidity : 60.0 % RH ± 10.0 % RH
Pressure : ±

Reasons for calibration
☐ New Installation ☐ Service / Repaired ☒ Re-calibration/ Maintenance

Ambients Conditions:
Temperature : 24.2 °C ± 5.0 °C
Humidity : 60.0 % RH ± 10.0 % RH
Pressure : ±

Equipment Condition: ☒ Good Operate ☐ Fair

Measurement Method UKAS Publication Ref :Lab 14

The measurement uncertainty stated is the expended 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). The calibration certificate documents the traceability to National Standards, which realise the unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came form list of Sartorius Metrological Specifications.

Traceability:

Model Number	Description	Traceability	Certificate No.	Due Date
YCS011-522-00	Sartorius weight set 1mg - 5000g E2,YCS011-522-00	SPC-RT	C02212565	14-Sep-2023
MHB-382SD	Humidity/Barometer/Temp Lutron MHB-382SD	DKSH	C19220444	5-Sep-2023

This certificate relate and apply this equipment only.
This certificate may not be reproduced other than in full except with the prior written approval of the Verification Operation Division
Sartorius (Thailand) Co., Ltd.

Mr.chonchai Inthana(Technical Manager)

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M
P

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 Fax: +66 2643-8367, e-mail: service.thailand@sartorius.com

SARTORIUS

Certificate of Calibration

Model Number : LA130S-F
Description : Analytical Balance
Serial Number : 25409664
ID No. : RYG_EN0001
Manufacturer : Sartorius

Certificate No. : 23BCI0110
Issued Date : Friday, March 03, 2023
Reference No. : 204833
Page No. : 2 of 2

Calibration Results : Without Adjustment

Repeatability

The reproducibility is the ability of a weighing instrument to display nearly identical readouts under constant test conditions when the same load within a measurement series is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express reproducibility quantitatively.

Nominal Value : (Low Load)	10.0000	100.0001
10 g	10.0000	100.0002
Tolerance	10.0001	100.0001
0.0001 g	10.0000	100.0000
	9.9999	100.0002
Nominal Value : (High Load)	10.0000	100.0001
100 g	10.0001	100.0001
Tolerance	10.0000	100.0001
0.0001 g	9.9999	100.0002
	9.9998	100.0001
Standard Deviation	0.00009	0.00006

Eccentricity (Off-center loading error)

The off-center loading error is yielded by the difference between the readout of the load, i.e. 1/3 or 1/4 of maximum capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to OIML R76).

Nominal value :	50	g
Tolerance	0.0004	g
	Difference	
1	-	
2	0.0000	
3	-0.0001	
4	0.0001	
5	0.0000	
6	-	

Linearity

The linearity, also called linearity error. Describes the deviation of the characteristic curve of a weighing instrument from the linear slope.

Tolerance		0.0002 g		
Nominal Value	Conventional Mass Value	Displayed Value	Deviation	Uncertainty
(g)	(g)	(g)	(g)	(g)
0.01	0.0100	0.0100	0.0000	0.00022
0.05	0.0500	0.0500	0.0000	0.00023
0.1	0.1000	0.1000	0.0000	0.00023
0.5	0.5000	0.5000	0.0000	0.00023
1	1.0000	1.0000	0.0000	0.00023
2	2.0000	2.0000	0.0000	0.00023
5	5.0000	5.0000	0.0000	0.00022
10	10.0000	10.0001	0.0001	0.00024
20	20.0000	20.0001	0.0001	0.00023
100	100.0000	100.0002	0.0002	0.00026

End of Report.

SOP FM 33 03 February 2022

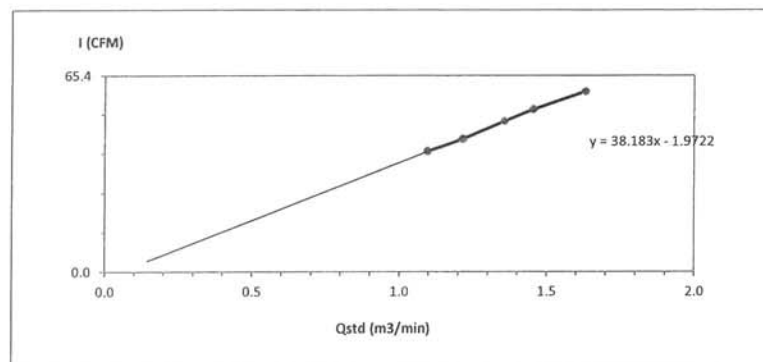
SOP FM 33 03 February 2022



High Volume Air Sampler Calibration Worksheet

Project Site : Siam Styrene Monomer Co., Ltd. Barometric Pressure (mm Hg) : 756
 Calibrate Location : บ้านอ่าวประดู่ (โรงพยาบาลส่งเสริมสุขภาพตำบลตากวน) Temperature (°C) : 30
 Calibrate Date : 14-Sep-23 High Volume ID : RYG_FS0664
 Calibration Sheet No. : C-140923-RYG_FS0664 High Volume Model : TE-5009X
 Calibrator ID : RYG_FS0206 High Volume S/N : 6261
 Calibrator Model : TE-5028A Calibrator Slope : 1.47433
 Calibrator S/N : 1543 Calibrator Intercept : -0.01503

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.6	1.0968	40	Slope : 38.1828 Intercept : -1.9722 Correlation Coefficient : 0.9990
2	3.2	1.2151	44	
3	4.0	1.3568	50	
4	4.6	1.4539	54	
5	5.8	1.6307	60	



Calibrated by Sitpawit.S
 (Mr. Sitpawit Suwannarat)
 Field Scientist(1)

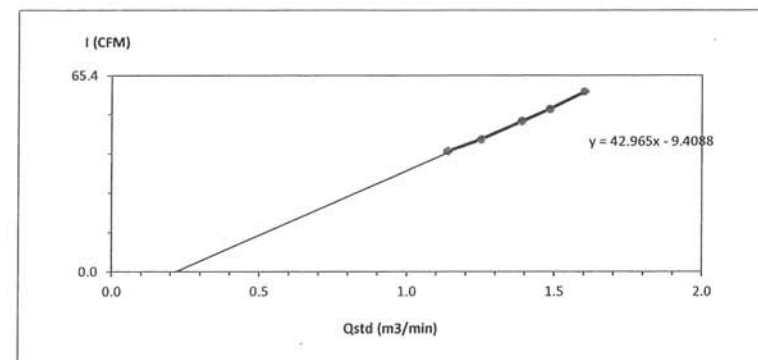
Approved by Noppong Juntarupan
 (Mr. Noppong Juntarupan)
 Enviro Field Coordinator Scientist (3)



High Volume Air Sampler Calibration Worksheet

Project Site : Siam Styrene Monomer Co., Ltd. Barometric Pressure (mm Hg) : 756
 Calibrate Location : บ้านนาบตาพุด Temperature (°C) : 30
 Calibrate Date : 14-Sep-23 High Volume ID : RYG_FS0292
 Calibration Sheet No. : C-140923-RYG_FS0292 High Volume Model : TE-5170D
 Calibrator ID : RYG_FS0206 High Volume S/N : 5497
 Calibrator Model : TE-5028A Calibrator Slope : 1.47433
 Calibrator S/N : 1543 Calibrator Intercept : -0.01503

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.8	1.1376	40	Slope : 42.9651 Intercept : -9.4088 Correlation Coefficient : 0.9980
2	3.4	1.2521	44	
3	4.2	1.3899	50	
4	4.8	1.4848	54	
5	5.6	1.6026	60	



Calibrated by Sitpawit.S
 (Mr. Sitpawit Suwannarat)
 Field Scientist(1)

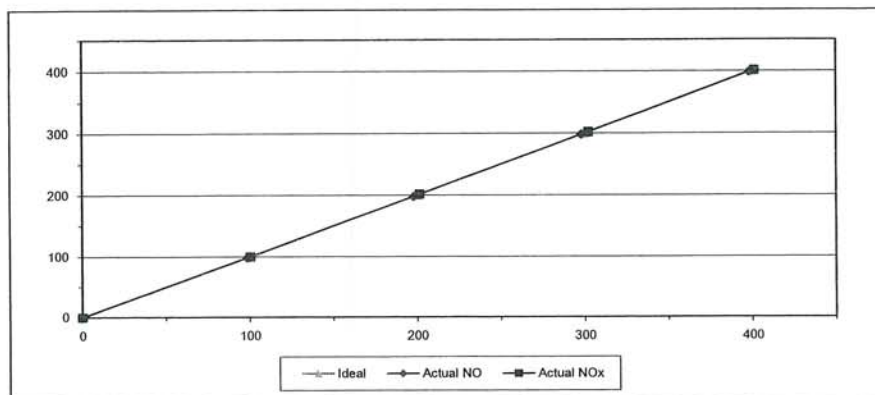
Approved by Noppong Juntarupan
 (Mr. Noppong Juntarupan)
 Enviro Field Coordinator Scientist (3)




MULTIPOINT CALIBRATION REPORT

Calibration Date	1-Jul-23	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	SEEAW53E	Equipment ID	RYG_FS0261
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	100.40	0.40	0.40
2	200.00	197.80	-2.20	-1.10	201.50	1.50	0.75
3	300.00	298.10	-1.90	-0.63	302.20	2.20	0.73
4	400.00	398.50	-1.50	-0.38	401.40	1.40	0.35
AVERAGE (%)				-0.66	0.47		



Calibrated By


(Mr.Jirawut Sakam)
Field Environmental Scientist (3)

Approved By


(Mr.Sarayuth Jitranont)
Assistant General Manager

ALS Laboratory Group

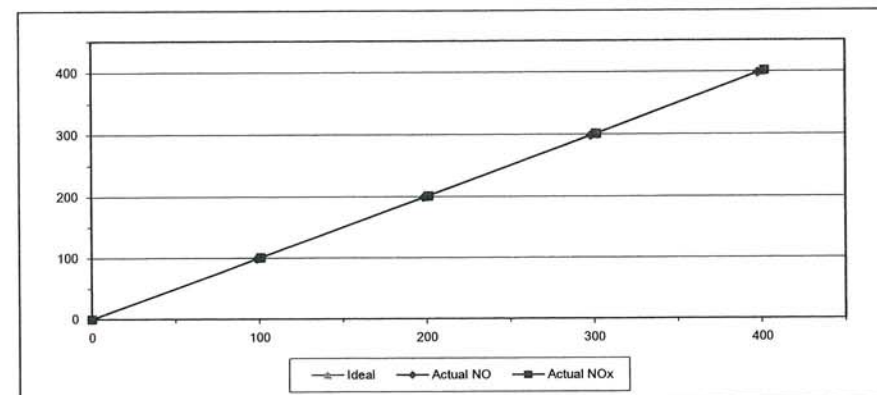
FORM NO.: F 06-056 REVISION NO.: - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	1-Jul-23	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	U8AOEAGK	Equipment ID	RYG_FS0551
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	101.00	1.00	1.00
2	200.00	198.50	-1.50	-0.75	201.30	1.30	0.65
3	300.00	298.40	-1.60	-0.53	301.50	1.50	0.50
4	400.00	398.20	-1.80	-0.45	402.00	2.00	0.50
AVERAGE (%)				-0.53	0.55		



Calibrated By

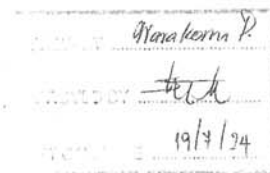

(Mr.Jirawut Sakam)
Field Environmental Scientist (3)

Approved By


(Mr.Sarayuth Jitranont)
Assistant General Manager

ALS Laboratory Group

FORM NO.: F 06-056 REVISION NO.: - ISSUE DATE: 02/04/12



Certificate Number

CL-011-66

Certificate Number

CL-011-66

Page 2 of 2 Pages

MEASUREMENT RESULTS⁵

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 m/s	D _{ind} Degree (°)	D _{use} Degree (°)	Error Degree (°)	U (k=2) Degree (°)
5.03	0.000	0	0	0.58
	45.000	41	-4	0.68
	90.000	88	-2	0.74
	135.000	133	-2	0.58
	180.000	180	0	0.74
	225.000	228	3	0.74
	270.000	273	3	0.68
	315.000	316	1	0.74

Remark:

⁵ Calibration results only count for the tested circumstances and environmental conditions during which calibration took place

⁶ Direction of standard

⁷ Direction of Unit Under Calibration

End of Certificate of Calibration

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM MANUFACTURER MODEL/TYPE

: Wind Direction Sensor
: Novalynx
: Sensor: WS-02F
: Data logger: 200-WS-25DL

SERIAL NUMBER

: Sensor: -
: Data logger: A4987

ID NUMBER

: RYG_F50089

CONDITION AS-RECEIVED CUSTOMER

: Used item
: ALS laboratory group (Thailand) Co., Ltd.
: 104 Phatthanakan 40, Phatthanakan Rd, Khwaeng Suan Luang,
: Khet Suan Luang, Bangkok 10250 Thailand.

RECEIVED DATE

: 16 Jan 2023

MEASUREMENT DATE

: 19 Jan 2023

ISSUE DATE

: 20 Jan 2023

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH
Atmospheric Pressure : 1010 ± 10 hPa

PLACE OF CALIBRATION

: Eiffel-type wind tunnel of Jiranatee Associates Co., Ltd.

CALIBRATION CONDITION

: Wind tunnel cross-section area¹ 900 cm²
: Win direction frontal area² 129 cm²
: Diameter of mounting pipe³ - mm
: Blockage ratio of test object⁴ 0.143 [-]

Preconditioning

: 24 hours at ambient conditions.

Measurement Condition

: The average values during measurement are (24.1)°C, (54.3) %RH and (1015.2) hPa.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

☒ Mr. Sorawit Thitthad
☐ Miss Jitraporn Lertkomphol

Approved signatory:

Mr. Parinya Booncharoen
Calibration Department Manager

Remarks:

¹ Nozzle cross-section area of the wind tunnel
² Projected cross-section area of the tested object include mounting pipe
³ Diameter of mounting pipe
⁴ Ratio $\frac{A_o}{A_t}$

Calibration procedure:

The wind direction sensor was calibrated against Standard Rotary Encoder model AX4009T5 DM04-P3-S-U0 in an close test section of Eiffel-type wind tunnel with 900 cm² cross test section area. The WI-CL-008 based on IEC 61400-12-1, Wind energy generation systems - Part 12-1: 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 recognized the national standards, and to realization of the international system of units (SI) through the NIMT (National Metrology Institute of Thailand) via Certificate number: DA-0043-22

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'

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM MANUFACTURER MODEL/TYPE

: Cup anemometer
: Novalynx
: Sensor: WS-02F
Data logger: 200-WS-25DL

SERIAL NUMBER

: Sensor: -
Data logger: A4987

ID NUMBER

: RYG_FS0089

CONDITION AS-RECEIVED CUSTOMER

: Used item
: ALS laboratory group (Thailand) co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd, Khwaeng Suan Luang,
Khet Suan Luang, Bangkok 10250 Thailand.

RECEIVED DATE

: 16 Jan 2023

MEASUREMENT DATE

: 18 Jan 2023

ISSUE DATE

: 20 Jan 2023

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH
Atmospheric Pressure : 1010 ± 10 hPa

PLACE OF CALIBRATION

: Eiffel-type wind tunnel of Jiranatee Associates Co., Ltd.

CALIBRATION CONDITIONS

: Wind tunnel cross-section area¹ 900 cm²
Win direction frontal area² 100 cm²
Diameter of mounting pipe³ - mm
Blockage ratio of test object⁴ 0.111 [-]

Preconditioning

: 24 hours at ambient conditions.

Measurement Condition

: The average values during measurement are (23.5) °C, (52.8) %RH and (1014.1) hPa.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

☒ Mr. Sorawit Thachalad
☐ Miss Jitraporn Lertsomphol

Approved signatory:

Mr. Parinya Booncharoen
Calibration Department Manager

Remark:

¹ Nozzle cross-section area of the wind tunnel

² Projected cross-section area of the tested object include mounting pipe

³ Diameter of mounting pipe

⁴ Ratio ² to ¹

Calibration procedure:

The cup anemometer was calibrated against Standard air velocity transducer model: 8455-12 and pitot tube with precision differential pressure meter model: DPM2500 in an anechoic test section of Eiffel-type wind tunnel with 900 cm² cross test section area. The WI-CL-007 based on IEC 61400-12-1, Wind energy generation systems - Part 12-1: 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 recognized the national standards, and to realization of the international system of units (SI) through the NIMT (National Metrology Institute of Thailand) via Certificate number: MW-0052-21 and MW-0066-22

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'

Page 2 of 2 Pages

MEASUREMENT RESULTS ⁵

The cup anemometer, Unit Under Calibration (UUC) was exercise 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 and above 5 m/s to 30 m/s was calculated by a pitot tube with precision differential pressure meter which was installed 40 mm and 300 mm respectively away from wind tunnel nozzle, UUC was installed at center of the 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_{UUC} (m/s)	Error (m/s)	U (k=2) (m/s)
0.983	23.50	23.45	0.8	-0.2	0.17
2.035	23.44	23.45	1.9	-0.1	0.16
3.049	23.50	23.45	2.9	-0.2	0.19
4.136	23.50	23.45	3.9	-0.2	0.20
5.01	23.40	23.45	4.9	-0.1	0.18
6.00	23.50	23.45	5.9	-0.1	0.19
7.07	23.40	23.45	7.0	-0.1	0.19
8.18	23.50	23.45	8.0	-0.2	0.19
9.10	23.26	23.45	9.0	-0.1	0.20
10.09	23.44	23.45	9.9	-0.1	0.21
11.15	23.30	23.45	11.0	-0.1	0.21
12.14	23.42	23.45	12.0	-0.1	0.25
13.20	23.22	23.45	13.1	-0.1	0.26
14.25	23.34	23.45	14.1	-0.1	0.24
15.24	23.24	23.45	15.0	-0.3	0.26
16.31	23.24	23.45	16.1	-0.2	0.24

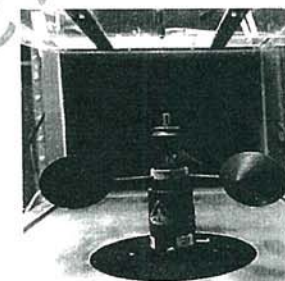
Remark:

¹ Calibration results only count for the tested circumstances and environmental conditions during which calibration took place

⁵ Velocity of standard

⁶ Velocity of Unit 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 proportion of the set-up is not true to scale due to imaging geometry.

End of Certificate of Calibration

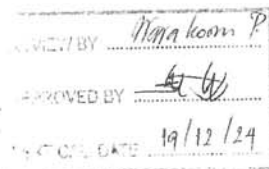


JIRANATEE ASSOCIATES CO., LTD.

Jiranatee Associates Co., Ltd.
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Petchkasem 7,7/1, Rd Wattapra, Bangkok,
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E-mail: jnac_calibration@jiranatee.com
Web site: www.jiranatee.com

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Air speed measurement laboratory
Calibration services department.



Certificate Number

CC-008-66

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM MANUFACTURER MODEL/TYPE

Cup anemometer
Novallux
Sensor: WS-02F
Data logger: 200-WS-25DL
Sensor: WSD-A4985
Data logger: A4985

SERIAL NUMBER

RYG_FS0085

ID NUMBER

CONDITION AS-RECEIVED CUSTOMER

Used item
ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd, Khwaeng Suan Luang,
Khet Suan Luang, Bangkok 10250 Thailand.

RECEIVED DATE

16 Jun 2023

MEASUREMENT DATE

19 Jun 2023

ISSUE DATE

19 Jun 2023

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature: 23.0 ± 3.0 °C
Relative Humidity: 55.0 ± 15.0 %RH
Atmospheric Pressure: 1010 ± 10 hPa

PLACE OF CALIBRATION

Eiffel-type wind tunnel of Jiranatee Associates Co., Ltd.

CALIBRATION CONDITIONS

Wind tunnel cross-section area¹ 900 cm²
Win direction frontal area² 100 cm²
Diameter of mounting pipe³ mm
Blockage ratio of test object⁴ 0.111 [-]

Preconditioning

24 hours at ambient conditions.

Measurement Condition

The average values during measurement are (25.0) °C, (42.7) %RH and (1011.7) hPa.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

☒ Mr. Sorawit Thachalad
☐ Miss Jitraporn Lertsomphol



Approved signatory:

Mr. Parinya Booncharoen
Calibration Department Manager

Remark:

¹ Nozzle cross-section area of the wind tunnel

² Projected cross-section area of the tested object include mounting pipe

³ Diameter of mounting pipe

⁴ Ratio $\frac{A}{A_0}$

Calibration procedure:

The cup anemometer was calibrated against Standard air velocity transducer model: 8455-12 and pitot tube with precision differential pressure meter model: DPM2500 in an closed test-section of Eiffel-type wind tunnel with 900 cm² cross test section area. The WI-CL-007 based on IEC 61400-12-1, Wind energy generation systems – Part 12-1: 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 recognized the national standards, and to realization of the international system of units (SI) through the NIMT (National Metrology Institute of Thailand) via Certificate number: MW-0052-21 and MW-0066-22

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"

Certificate Number

CC-008-66

Page 2 of 2 Pages

MEASUREMENT RESULTS⁵

The cup anemometer, Unit Under Calibration (UUC) was exercise 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 and above 5 m/s to 30 m/s was calculated by a pitot tube with precision differential pressure meter which was installed 40 mm and 300 mm respectively away from wind tunnel nozzle, UUC was installed at center of the 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_{std} (m/s)	Temp. wind tunnel (°C)	Temp. room (°C)	v_{UUC} (m/s)	Error (m/s)	$U (k=2)$ (m/s)
1.025	24.90	24.95	0.9	-0.1	0.31
2.028	24.96	24.95	1.9	-0.1	0.31
2.997	25.00	24.95	2.9	-0.1	0.31
4.126	25.00	24.95	4.0	-0.1	0.31
5.02	24.90	24.95	4.9	-0.1	0.31
6.00	24.88	24.95	5.9	-0.1	0.31
7.05	24.90	24.95	7.0	-0.1	0.31
8.18	24.74	24.95	8.0	-0.1	0.31
9.09	24.84	24.95	9.0	0.0	0.31
10.07	24.70	24.95	10.0	-0.1	0.31
11.14	24.78	24.95	11.1	-0.1	0.31
12.12	24.70	24.95	12.0	-0.1	0.31
13.17	24.70	24.95	13.1	0.0	0.35
14.24	24.70	24.95	14.1	-0.2	0.31
15.20	24.70	24.95	15.2	0.0	0.44
16.28	24.70	24.95	16.2	-0.1	0.31

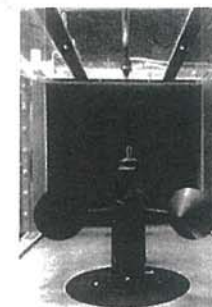
Remark:

¹ Calibration results only count for the tested circumstances and environmental conditions during which calibration took place

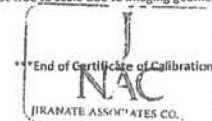
² Velocity of standard

³ Velocity of Unit 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 proportion of the set-up is not true to scale due to imaging geometry.



THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY



JIRANATEE ASSOCIATES CO., LTD.

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Web site: www.jiranatee.com

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Air speed measurement laboratory
Calibration services department.

Certificate Number

CD-008-66

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM MANUFACTURER MODEL/TYPE

: Wind Direction Sensor
: Novalymx
: Sensor: WS-02F
: Data logger: 200-WS-25DL

SERIAL NUMBER

: Sensor: WSD-A4985
: Data logger: A4985

ID NUMBER

: RYG_FS0085

CONDITION AS-RECEIVED CUSTOMER

: Used item
: ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd, Khwaeng Suan Luang,
Khet Suan Luang, Bangkok 10250 Thailand.

RECEIVED DATE

: 16 Jun 2023

MEASUREMENT DATE

: 19 Jun 2023

ISSUE DATE

: 19 Jun 2023

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH
Atmospheric Pressure : 1010 ± 10 hPa

PLACE OF CALIBRATION

: Eiffel-type wind tunnel of Jiranatee Associates Co., Ltd.

CALIBRATION CONDITION

: Wind tunnel cross-section area¹ 900 cm²
Win direction frontal area² 129 cm²
Diameter of mounting pipe³ - mm
Blockage ratio of test object⁴ 0.143 [-]

Preconditioning

: 24 hours at ambient conditions.

Measurement Condition

: The average values during measurement are (24.1)°C, (55.4) %RH and (1008.5) hPa.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

☒ Mr. Sorawit Thachalad
☐ Miss Jittraporn Lertsomphol



Approved signatory:

Mr. Parinya Booncharoen
Calibration Department Manager

Remark:

¹ Nozzle cross-section area of the wind tunnel
² Projected cross-section area of the tested object include mounting pipe
³ Diameter of mounting pipe
⁴ Ratio² to¹

Certificate Number

CD-008-66

Page 2 of 2 Pages

MEASUREMENT RESULTS⁵

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 m/s	D _{std} Degree (°)	D _{unc} Degree (°)	Error Degree (°)	U (k=2) Degree (°)
5.01	45.000	44	-1	1.0
	90.001	87	-3	1.0
	135.000	132	-3	1.0
	180.000	179	-1	1.0
	225.000	228	3	1.0
	270.000	273	3	1.0
	315.000	319	4	1.0
	360.000	359	-1	1.0

Remark:

⁵ Calibration results only count for the tested circumstances and environmental conditions during which calibration took place

⁶ Direction of standard

⁷ Direction of Unit Under Calibration

End of Certificate of Calibration



SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

451-451/1 Sirinthorn Rd.,Bangbunru, Bangplud Bangkok 10700 THAILAND.
Tel.0-2435-8800 Fax.0-2433-1679 e-mail:cal-center@sithiporn.com http://www.sithiporn.com



Cert. No. : ACC23005
Pages : 1 of 3

Calibration Certificate

Equipment : SOUND CALIBRATOR
Manufacturer : RION
Model : NC-75
Serial No.: 35002736
ID No.: RYG_FS0496

Condition As Found : GOOD

Customer : A.I.S LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWANG 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 : 06 JANUARY 2023
Calibration Date : 17 JANUARY 2023
Date of Issue : 19 JANUARY 2023

Calibrated by : Nathakorn Pisutpaisan

Approved by :

T. Petchurai
(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.

SITHIPORN / SITHIPORN ASSOCIATES CO.,LTD. associates CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACC23005
Job No. : VC66AC0024
Pages : 2 of 3

Calibration Procedure : CP-AC-03

Calibration Method :

This equipment was calibrated by based on IEC-60942-2003 Standard.

The sound pressure level, frequency and total distortion of the sound calibrator was measured using the reference microphone.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33511B	MY52302742	EF-0008-22	04-Feb-23
Digital Multimeter	33461A	MY53220104	EEL.BP. 04/0265	09-Feb-23
Digital Multimeter	33461A	MY53220076	EEL.BP. 03/0265	09-Feb-23
Digital Multimeter	33461A	MY60024273	EEL.BP. 05/0265	09-Feb-23
Programmable Attenuator	MAT-1070	62100114	EF-0009-22	07-Feb-23
Condenser Microphone	4180	2977900	AA-1013-22	24-Feb-23
Measuring Amplifier	NA-42KAI	34560495	AA-3005-22	22-Feb-23
Audio Analyzer	AVR-3360A	V744B6069	EF-0010-22	07-Feb-23

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. Petchurai

Cert. No. : ACC23005
Job No. : VC66AC0024
Pages : 3 of 3

Result of calibration :

1. Sound pressure level

Specified sound pressure level (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit (dB)
94	93.98	-0.02	0.14	0.40

2. Frequency

Specified Frequency (Hz)	Measured value (Hz)	Deviated value (%)	Uncertainty (%)	Tolerance limit (%)
1000	1000.0	0.0	0.1	1.0

3. Total distortion

Measured value (%)	Uncertainty (%)	Tolerance limit (%)
0.35	0.10	3.0

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

451-451/1 Sirinthorn Rd, Bangbumru, Bangplud Bangkok 10700 THAILAND.
Tel.0-2435-8800 Fax.0-2433-1679 e-mail:cal-center@sithiporn.com http://www.sithiporn.com



Cert. No. : ACL23044
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42/ Microphone UC-52 / Preamplifier NH-24
Serial No.: 00900073 / 188466 / 01735
ID No.: RYG_FS0494

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHIWAENG 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 : 06 JANUARY 2023
Calibration Date : 13-18 JANUARY 2023
Date of Issue : 19 JANUARY 2023

Calibrated by : Nathakorn Pisutpaisan

Approved by :

T. Petchurai
(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.

Continuation of Calibration Certificate

Cert. No. : ACL23044
Job No. : VC66AC0024
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based 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-0007-22	04-Feb-23
Waveform Generator	33511B	MY52302742	EF-0008-22	04-Feb-23
Digital Multimeter	33461A	MY53220104	EEL.BP. 04/0265	09-Feb-23
Digital Multimeter	33461A	MY53220076	EEL.BP. 03/0265	09-Feb-23
Digital Multimeter	34461A	MY60024273	EEL.BP. 05/0265	09-Feb-23
Programmable Attenuator	MAT-1070	62100114	EF-0009-22	07-Feb-23
Condenser Microphone	4180	2977900	AA-1013-22	24-Feb-23
Measuring Amplifier	NA-42KAI	34560495	AA-3005-22	22-Feb-23

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).

Continuation of Calibration Certificate

Cert. No. : ACL23044
Job No. : VC66AC0024
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	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	-	-	-	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

Continuation of Calibration Certificate

Cert. No. : ACL23044
Job No. : VC66AC0024
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.95)	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	Measured value (dB)
A - weight	11.6
C - weight	17.8
Flat	23.7

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	0.1	0.1	0.1	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	-0.2	-0.2	-0.1	±5.0

Continuation of Calibration Certificate

Cert. No. : ACL23044
Job No. : VC66AC0024
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	-0.1	-0.1	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	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	0.0	-
C - weight	94.0	0.0	± 0.2
Flat	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	± 0.1
Leq	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

Continuation of Calibration Certificate

Cert. No. : ACL23044
Job No. : VC66AC0024
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	29.9	-0.1	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	28.0	0.0	± 1.1
27.0	26.9	-0.1	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

Continuation of Calibration Certificate

Cert. No. : ACL23044
Job No. : VC66AC0024
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)
Auto	94.0	94.0	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	108.0	108.0	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	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	128.1	0.1	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lcpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	136.1	-0.3	±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	-
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

Continuation of Calibration Certificate

Cert. No. : ACL23044
Job No. : VC66AC0024
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.6	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

451-451/1 Sirinthorn Rd, Bangbunru, Bangplud Bangkok 10700 THAILAND.
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Cert. No. : ACL22226
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A/ Microphone UC-52 / Preamplifier NH-24
Serial No.: 00623387 / 198634 / 26415
ID No.: -

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHAENG 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 : 28 SEPTEMBER 2022
Calibration Date : 12-17 OCTOBER 2022
Date of Issue : 18 OCTOBER 2022



Calibrated by : Nathakorn Pisutpaisan

Approved by :

T. Petchurai
(Thanakul Petchurai)

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Continuation of Calibration Certificate

Cert. No. : ACL22226
Job No. : VC65AC0086
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based 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-0007-22	04-Feb-23
Waveform Generator	33511B	MY52302742	EF-0008-22	04-Feb-23
Digital Multimeter	33461A	MY53220104	EEL.BP. 04/0265	09-Feb-23
Digital Multimeter	33461A	MY53220076	EEL.BP. 03/0265	09-Feb-23
Digital Multimeter	34461A	MY60024273	EEL.BP. 05/0265	09-Feb-23
Programmable Attenuator	MAT-1070	62100114	EF-0009-22	07-Feb-23
Condenser Microphone	4180	2977900	AA-1013-22	24-Feb-23
Measuring Amplifier	NA-42KAI	34560495	AA-3005-22	22-Feb-23

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).

Continuation of Calibration Certificate

Cert. No. : ACL22226
Job No. : VC65AC0086
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	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	-	-	-	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

Continuation of Calibration Certificate

Cert. No. : ACL22226
Job No. : VC65AC0086
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.95)	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	Measured value (dB)
A - weight	11.6
C - weight	17.7
Flat	23.5

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	0.2	0.1	0.2	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	0.4	0.5	0.5	±5.0

T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL22226
Job No. : VC65AC0086
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	0.0	±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	-0.1	±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	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	0.0	-
C - weight	94.0	0.0	± 0.2
Flat	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	± 0.1
Leq	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.

Continuation of Calibration Certificate

Cert. No. : ACL22226
Job No. : VC65AC0086
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	132.9	-0.1	± 1.1
132.0	131.9	-0.1	± 1.1
131.0	130.9	-0.1	± 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	30.0	0.0	± 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	26.1	0.1	± 1.1
25.0	25.1	0.1	± 1.1

T. Retch.

Continuation of Calibration Certificate

Cert. No. : ACL22226
Job No. : VC65AC0086
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)
Auto	94.0	94.0	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	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	134.0	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

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	133.0	133.0	0.0	-
One	136.4	135.8	-0.6	±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	-
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

T. Retch.

Continuation of Calibration Certificate

Cert. No. : ACL22226
Job No. : VC65AC0086
Pages : 8 of 8

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	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

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Cert. No. : ACL22228
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A/ Microphone UC-52 / Preamplifier NH-24
Serial No.: 00623389 / 198636 / 26417
ID No.: -

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 : 28 SEPTEMBER 2022
Calibration Date : 12-17 OCTOBER 2022
Date of Issue : 18 OCTOBER 2022

REVIEW BY	<i>Nathakorn P</i>
APPROVED BY	<i>[Signature]</i>
NEXT CAL DATE	12/10/23

Calibrated by : Nathakorn Pisutpaisan

Approved by :

T. Petchur
(Thanakul Petchurai)

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Continuation of Calibration Certificate

Cert. No. : ACL22228
Job No. : VC65AC0086
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based 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-0007-22	04-Feb-23
Waveform Generator	33511B	MY52302742	EF-0008-22	04-Feb-23
Digital Multimeter	33461A	MY53220104	EEL.BP. 04/0265	09-Feb-23
Digital Multimeter	33461A	MY53220076	EEL.BP. 03/0265	09-Feb-23
Digital Multimeter	34461A	MY60024273	EEL.BP. 05/0265	09-Feb-23
Programmable Attenuator	MAT-1070	62100114	EF-0009-22	07-Feb-23
Condenser Microphone	4180	2977900	AA-1013-22	24-Feb-23
Measuring Amplifier	NA-42KAI	34560495	AA-3005-22	22-Feb-23

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).

Continuation of Calibration Certificate

Cert. No. : ACL22228
Job No. : VC65AC0086
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	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	-	-	-	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

Continuation of Calibration Certificate

Cert. No. : ACL22228
Job No. : VC65AC0086
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.95)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.2

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Measured value (dB)
A - weight	9.9
C - weight	16.5
Flat	22.2

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	0.2	0.2	0.2	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	1.0	1.1	1.1	±5.0

T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL22228
Job No. : VC65AC0086
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	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	0.0	-
C - weight	94.0	0.0	± 0.2
Flat	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	± 0.1
Leq	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.

Continuation of Calibration Certificate

Cert. No. : ACL22228
Job No. : VC65AC0086
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	89.1	0.1	± 1.1
84.0	84.1	0.1	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.1	0.1	± 1.1
69.0	69.1	0.1	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.1	0.1	± 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	29.1	0.1	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.0	0.0	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.1	0.1	± 1.1

T. Retth

Continuation of Calibration Certificate

Cert. No. : ACL22228
Job No. : VC65AC0086
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)
Auto	94.0	94.0	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	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	134.0	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

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lcpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	135.8	-0.6	±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	-
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

T. Retth

Continuation of Calibration Certificate

Cert. No. : ACL22228
Job No. : VC65AC0086
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.6	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

451-451/1 Sirinthorn Rd., Bangbunru, Bangplud Bangkok 10700 THAILAND.
Tel.0-2435-8800 Fax.0-2433-1679 e-mail:cal-center@sithiphorn.com http://www.sithiphorn.com



Cert. No. : ACC23009
Pages : 1 of 3

Calibration Certificate

Equipment : SOUND CALIBRATOR
Manufacturer : RION
Model : NC-74
Serial No. : 34178121
ID No. : RYG_FS0213

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 : 24 JANUARY 2023
Calibration Date : 26 JANUARY 2023
Date of Issue : 27 JANUARY 2023

Calibrated by : Nathakorn Pisutpaisan

Approved by :

T. Petchurai
(Thanakul Petchurai)

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other than in full, except with the prior written approval of the head of Calibration Laboratory.

Continuation of Calibration Certificate

Cert. No. : ACC23009
Job No. : VC66AC0031
Pages : 2 of 3

Calibration Procedure : CP-AC-03

Calibration Method :

This equipment was calibrated by based on IEC-60942-2003 Standard.

The sound pressure level, frequency and total distortion of the sound calibrator was measured using the reference microphone.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33511B	MY52302742	EF-0008-22	04-Feb-23
Digital Multimeter	33461A	MY53220104	EEL.BP. 04/0265	09-Feb-23
Digital Multimeter	33461A	MY53220076	EEL.BP. 03/0265	09-Feb-23
Digital Multimeter	33461A	MY60024273	EEL.BP. 05/0265	09-Feb-23
Programmable Attenuator	MAT-1070	62100114	EF-0009-22	07-Feb-23
Condenser Microphone	4180	2977900	AA-1013-22	24-Feb-23
Measuring Amplifier	NA-42KAI	34560495	AA-3005-22	22-Feb-23
Audio Analyzer	AVR-3360A	V744B6069	EF-0010-22	07-Feb-23

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).

Continuation of Calibration Certificate

Cert. No. : ACC23009
Job No. : VC66AC0031
Pages : 3 of 3

Result of calibration :

1. Sound pressure level

Specified sound pressure level (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit (dB)
94	94.16	0.16	0.14	0.40

2. Frequency

Specified Frequency (Hz)	Measured value (Hz)	Deviated value (%)	Uncertainty (%)	Tolerance limit (%)
1000	1003.2	0.3	0.1	1.0

3. Total distortion

Measured value (%)	Uncertainty (%)	Tolerance limit (%)
1.97	0.10	3.0

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

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

451-451/1 Sirinthorn Rd.,Bangbunru, Bangplud Bangkok 10700 THAILAND.
Tel.0-2435-8800 Fax.0-2433-1679 e-mail:cal-center@sithiporn.com http://www.sithiporn.com



NSC-TISI-TIS 17025
CALIBRATION 0394

Cert. No. : ACL23330

Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A/ Microphone UC-52 / Preamplifier NH-24
Serial No.: 00222542 / 195375 / 15374
ID No.: NKH_FS0115

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHAENG 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 : 20 OCTOBER 2023
Calibration Date : 01-02 NOVEMBER 2023
Date of Issue : 03 NOVEMBER 2023



Calibrated by :

Nathakorn Pisutpaisan

Approved by :

T. Petchurai
(Thanakul Petchurai)

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QF-TS12-04-04-020664

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL23330
Job No. : VC67AC0013
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based 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-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL.BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

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).

QF-TS12-04-04-020664

T. Petchurai

Continuation of Calibration Certificate

Cert. No. : ACL23330
Job No. : VC67AC0013
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	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	-	-	-	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

Note : Pass/Fail evaluation for each parameter,
will be considered together from the acceptance limit and the Maximum-permitted uncertainty of measurement.

T. Retin

Continuation of Calibration Certificate

Cert. No. : ACL23330
Job No. : VC67AC0013
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.6

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Measured value (dB)
A - weight	10.8
C - weight	16.9
Flat	22.6

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)			Acceptance Limits
	Flat	C-weight	A-weight	
125	0.2	0.2	0.2	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	1.2	1.2	1.2	±5.0

T. Retin

Continuation of Calibration Certificate

Cert. No. : ACL23330
Job No. : VC67AC0013
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	0.0	±2.0
125	0.0	0.0	-0.1	±1.5
250	0.0	0.0	-0.1	±1.5
500	0.0	0.0	-0.1	±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	0.0	0.0	±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

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T. Rethu-

Continuation of Calibration Certificate

Cert. No. : ACL23330
Job No. : VC67AC0013
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	137.1	0.1	± 1.1
136.0	136.1	0.1	± 1.1
135.0	135.1	0.1	± 1.1
134.0	134.1	0.1	± 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	129.1	0.1	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.1	0.1	± 1.1
114.0	114.1	0.1	± 1.1
109.0	109.1	0.1	± 1.1
104.0	104.1	0.1	± 1.1
99.0	99.1	0.1	± 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	26.1	0.1	± 1.1
25.0	25.1	0.1	± 1.1

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T. Rethu-

Continuation of Calibration Certificate

Cert. No. : ACL23330
Job No. : VC67AC0013
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)
Auto	94.0	94.0	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	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	134.0	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

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	133.0	133.0	0.0	±3.0
One	136.4	136.2	-0.2	±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

T. Petu -

Continuation of Calibration Certificate

Cert. No. : ACL23330
Job No. : VC67AC0013
Pages : 8 of 8

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	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k \approx 2$ or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

T. Petu -

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

451-451/1 Sirinthorn Rd.,Bangbunru, Bangplud Bangkok 10700 THAILAND.
Tel.0-2435-8800 Fax.0-2433-1679 e-mail:cal-center@sithiporn.com http://www.sithiporn.com



Cert. No. : ACL23329

Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A/ Microphone UC-52 / Preamplifier NH-24
Serial No.: 00222528 / 195374 / 15360
ID No.: NKH_FS0114

Condition As Found : GOOD

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

Location : -
Ambient Temperature : (23.0 \pm 3) °C
Pressure : (101.3 \pm 3) kPa
Relative Humidity : (50.0 \pm 20) %

Received Date : 20 OCTOBER 2023
Calibration Date : 01-02 NOVEMBER 2023
Date of Issue : 03 NOVEMBER 2023



Calibrated by : Nathakorn Pisutpaisan

Approved by :

T. Petchurai
(Thanakul Petchurai)

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SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL23329
Job No. : VC67AC0013
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based 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-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL.BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

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. Petchurai

Continuation of Calibration Certificate

Cert. No. : ACL23329
Job No. : VC67AC0013
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	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	-	-	-	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

Note : Pass/Fail evaluation for each parameter,
will be considered together from the acceptance limit and the Maximum-permitted uncertainty of measurement.

G. Retana

Continuation of Calibration Certificate

Cert. No. : ACL23329
Job No. : VC67AC0013
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	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	Measured value (dB)
A - weight	10.8
C - weight	17.2
Flat	23.0

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	0.2	0.2	0.2	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	0.8	0.9	0.9	±5.0

G. Retana

Continuation of Calibration Certificate

Cert. No. : ACL23329
Job No. : VC67AC0013
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	0.1	0.1	0.1	±1.5
250	0.1	0.0	0.0	±1.5
500	0.1	0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.1	±2.0
4000	0.0	0.1	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

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7. Peter

Continuation of Calibration Certificate

Cert. No. : ACL23329
Job No. : VC67AC0013
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	29.1	0.1	± 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

QF-TS12-04-04-020664

7. Peter

Continuation of Calibration Certificate

Cert. No. : ACL23329
Job No. : VC67AC0013
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)
Auto	94.0	94.0	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	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	116.9	-0.1	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	107.9	-0.1	1.5 ; -5.0
	200	800	127.6	127.5	-0.1	±1.0
SEL	0.25	1	99.0	98.8	-0.2	1.5 ; -5.0
	2	8	108.0	107.9	-0.1	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{cpeak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	135.8	-0.6	±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

Continuation of Calibration Certificate

Cert. No. : ACL23329
Job No. : VC67AC0013
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.7	89.5	-0.2	±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



ROTA METER CALIBRATION RESULT JULY 2023

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
BKK_FS0577	03 Jul 23	Y = 1.2484x - 0.6741	0.9931
BKK_FS0579	03 Jul 23	Y = 1.0997x - 0.4918	1.0000
BKK_FS0583	01 Jul 23	Y = 1.0068x + 1.6459	0.9998
BKK_FS0584	01 Jul 23	Y = 0.9804x + 9.469	0.9999
BKK_FS0585	07 Jul 23	Y = 1.0248x + 0.8333	0.9996
BKK_FS0586	01 Jul 23	Y = 0.9907x + 11.074	1.0000
BKK_FS0587	07 Jul 23	Y = 0.986x + 17.77	0.9993
BKK_FS0588	01 Jul 23	Y = 0.9751x + 9.8452	0.9999
BKK_FS0589	03 Jul 23	Y = 1.0174x + 0.0381	1.0000
BKK_FS0590	01 Jul 23	Y = 1.0127x - 3.4333	1.0000
BKK_FS0591	03 Jul 23	Y = 1.0452x - 51.824	0.9998
BKK_FS0592	07 Jul 23	Y = 1.0003x + 14.344	1.0000
BKK_FS0593	01 Jul 23	Y = 1.0386x - 41.415	0.9997
BKK_FS0594	07 Jul 23	Y = 1.0025x + 6.32	0.9999
BKK_FS0595	01 Jul 23	Y = 1.0871x - 114.97	0.9985
BKK_FS0596	03 Jul 23	Y = 1.038x - 51.974	0.9993
BKK_FS0597	01 Jul 23	Y = 1.0059x - 9.9086	1.0000
BKK_FS1004	01 Jul 23	Y = 1.0186x + 6.731	0.9998
BKK_FS1005	01 Jul 23	Y = 0.9922x + 13.993	0.9970
BKK_FS1006	01 Jul 23	Y = 1.1747x - 3.1235	0.9991
BKK_FS1007	07 Jul 23	Y = 1.0737x + 0.8677	0.9997
BKK_FS1008	07 Jul 23	Y = 1.0446x + 1.2156	0.9999
BKK_FS1009	01 Jul 23	Y = 1.1044x - 0.8245	1.0000
BKK_FS1010	03 Jul 23	Y = 1.2271x - 2.0139	1.0000
BKK_FS1011	03 Jul 23	Y = 1.261x - 1.7003	1.0000
BKK_FS1012	03 Jul 23	Y = 0.9978x - 3.7238	0.9990
BKK_FS1013	03 Jul 23	Y = 1.0245x - 28.65	0.9999
BKK_FS1014	01 Jul 23	Y = 1.3135x - 7.0966	0.9961
BKK_FS1015	01 Jul 23	Y = 0.9802x + 3.8214	0.9999
BKK_FS1016	01 Jul 23	Y = 1.0726x - 85.581	0.9995
BKK_FS1020	01 Jul 23	Y = 1.1161x - 1.1986	1.0000
BKK_FS1021	01 Jul 23	Y = 0.9566x + 16.524	0.9987
BKK_FS1022	01 Jul 23	Y = 1.0712x - 89.51	0.9990
BKK_FS1023	01 Jul 23	Y = 1.3791x - 8.8721	0.9944
BKK_FS1024	01 Jul 23	Y = 0.9449x + 11.421	0.9993
BKK_FS1025	01 Jul 23	Y = 1.0477x - 41.116	1.0000
BKK_FS1026	01 Jul 23	Y = 1.3389x - 4.918	1.0000
BKK_FS1027	01 Jul 23	Y = 0.9852x + 1.5238	1.0000
BKK_FS1028	01 Jul 23	Y = 1.0281x - 19.897	0.9996



ROTA METER CALIBRATION RESULT JULY 2023

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
BKK_FS1029	01 Jul 23	Y = 1.3382x - 8.9776	0.9941
BKK_FS1030	01 Jul 23	Y = 0.9818x + 2.3476	0.9995
BKK_FS1031	01 Jul 23	Y = 1.0526x - 64.415	0.9997
BKK_FS1039	01 Jul 23	Y = 0.998x + 14.823	0.9997
BKK_FS1040	01 Jul 23	Y = 1.0041x - 2.7552	0.9999
BKK_FS1041	01 Jul 23	Y = 1.116x - 1.0078	0.9999
BKK_FS1042	01 Jul 23	Y = 1.116x - 1.0078	0.9999
BKK_FS1043	01 Jul 23	Y = 1.0209x + 3.56	0.9980
BKK_FS1044	01 Jul 23	Y = 1.0039x - 5.0143	0.9999
BKK_FS1164	03 Jul 23	Y = 1.0807x + 0.9837	0.9998
BKK_FS1165	03 Jul 23	Y = 1.0589x + 4.6061	0.9996
BKK_FS1166	03 Jul 23	Y = 0.9809x + 7.5262	0.9981
BKK_FS1166	03 Jul 23	Y = 1.0567x - 50.446	0.9999
BKK_FS1200	03 Jul 23	Y = 1.3634x - 1.3816	0.9991
BKK_FS1201	03 Jul 23	Y = 1.0388x - 7.0524	0.9999
BKK_FS1202	03 Jul 23	Y = 1.0518x - 59.531	0.9998
RYG_FS0197	01 Jul 23	Y = 1.0087x - 3.2838	0.9999
RYG_FS0198	01 Jul 23	Y = 0.9877x + 36.487	0.9999
RYG_FS0199	01 Jul 23	Y = 1.0299x - 0.367	0.9992
PHK_FS0027	13 Jul 23	Y = 1.1219x - 2.2432	0.9984
PHK_FS0028	13 Jul 23	Y = 1.0341x - 6.7967	0.9999
PHK_FS0029	13 Jul 23	Y = 0.9977x + 8.7829	0.9999
SGK_FS0135	14 Jul 23	Y = 0.9877x + 11.513	0.9974
SGK_FS0138	13 Jul 23	Y = 1.0571x - 1.1565	0.9991
SGK_FS0139	13 Jul 23	Y = 0.9801x + 8.6267	0.9997
SGK_FS0140	13 Jul 23	Y = 0.9978x + 11.644	1.0000
SGK_FS0141	13 Jul 23	Y = 1.1349x - 2.2867	0.9990
SGK_FS0142	13 Jul 23	Y = 0.9915x + 11.403	0.9994
SGK_FS0143	13 Jul 23	Y = 1.0054x - 4.0648	1.0000

Review By :

Wichan Choonharat
(Mr. Wichan Choonharat)
Enviro Field Services Manager

Approved By :

Mr. Sarayuth Jittranont
(Mr. Sarayuth Jittranont)
Assistant General Manager



ROTA METER CALIBRATION RESULT OCTOBER 2023

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
BKK_FS0577	02 Oct 23	Y = 1.2862x - 1.2952	0.9963
BKK_FS0579	02 Oct 23	Y = 1.2546x + 0.0065	0.9946
BKK_FS0583	03 Oct 23	Y = 1.0773x - 2.4138	0.9989
BKK_FS0584	02 Oct 23	Y = 0.9787x + 12.569	0.9999
BKK_FS0585	18 Oct 23	Y = 1.0322x + 3.7767	0.9998
BKK_FS0586	02 Oct 23	Y = 0.9777x + 15.405	0.9997
BKK_FS0587	18 Oct 23	Y = 1.0175x + 14.717	0.9997
BKK_FS0589	03 Oct 23	Y = 1.0148x + 2.4143	1.0000
BKK_FS0590	03 Oct 23	Y = 1.0088x + 0.8429	1.0000
BKK_FS0591	02 Oct 23	Y = 1.0733x - 88.805	0.9989
BKK_FS0592	18 Oct 23	Y = 1.0037x + 10.388	1.0000
BKK_FS0593	02 Oct 23	Y = 1.0538x - 60.63	0.9996
BKK_FS0594	18 Oct 23	Y = 1.0052x + 5.3238	0.9999
BKK_FS0596	03 Oct 23	Y = 1.0449x - 48.241	0.9996
BKK_FS0597	03 Oct 23	Y = 1.0697x - 83.62	0.9994
BKK_FS1004	02 Oct 23	Y = 0.9855x + 14.75	0.9992
BKK_FS1005	02 Oct 23	Y = 1.02x + 1.7167	0.9996
BKK_FS1006	02 Oct 23	Y = 1.1762x - 3.5619	0.9999
BKK_FS1007	18 Oct 23	Y = 1.1405x + 2.6044	0.9993
BKK_FS1008	18 Oct 23	Y = 1.1267x + 4.8333	0.9991
BKK_FS1010	03 Oct 23	Y = 1.0027x + 2.5832	0.9986
BKK_FS1011	02 Oct 23	Y = 1.3811x - 6.2068	0.9998
BKK_FS1012	02 Oct 23	Y = 1.0017x + 0.9	1.0000
BKK_FS1013	02 Oct 23	Y = 1.0593x - 46.02	0.9994
BKK_FS1014	03 Oct 23	Y = 1.0961x - 1.6895	0.9983
BKK_FS1015	03 Oct 23	Y = 0.9979x + 6.2595	0.9993
BKK_FS1016	03 Oct 23	Y = 1.0683x - 82.491	0.9995
BKK_FS1017	06 Oct 23	Y = 0.9981x - 2.2235	0.9998
BKK_FS1018	06 Oct 23	Y = 0.9817x - 20.653	0.9999
BKK_FS1019	06 Oct 23	Y = 1.0152x - 64.485	0.9998
BKK_FS1020	02 Oct 23	Y = 1.2691x - 2.4721	0.9983
BKK_FS1021	02 Oct 23	Y = 1.0036x + 2.3286	0.9999
BKK_FS1022	02 Oct 23	Y = 1.0633x - 73.266	0.9990
BKK_FS1023	03 Oct 23	Y = 1.0879x - 1.0694	0.9984
BKK_FS1024	02 Oct 23	Y = 1.0035x + 1.4857	1.0000
BKK_FS1025	03 Oct 23	Y = 1.0556x - 58.597	0.9999
BKK_FS1026	02 Oct 23	Y = 1.2894x - 1.497	0.9970
BKK_FS1027	02 Oct 23	Y = 1.0032x + 1.5167	1.0000
BKK_FS1028	02 Oct 23	Y = 1.0433x - 30.012	0.9994



ROTA METER CALIBRATION RESULT OCTOBER 2023

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
BKK_FS1029	02 Oct 23	Y = 1.3494x - 3.5078	0.9981
BKK_FS1030	02 Oct 23	Y = 1.0015x + 1.2214	1.0000
BKK_FS1031	02 Oct 23	Y = 1.0516x - 56.996	0.9994
BKK_FS1039	02 Oct 23	Y = 0.9991x + 14.527	0.9994
BKK_FS1040	02 Oct 23	Y = 1.0049x - 2.4324	1.0000
BKK_FS1041	02 Oct 23	Y = 1.1682x - 2.1293	1.0000
BKK_FS1042	02 Oct 23	Y = 1.0051x + 6.2533	0.9989
BKK_FS1043	02 Oct 23	Y = 1.0022x + 3.96	1.0000
BKK_FS1044	02 Oct 23	Y = 1.0796x + 2.9806	0.9993
BKK_FS1164	02 Oct 23	Y = 1.2714x + 0.234	0.9945
BKK_FS1165	02 Oct 23	Y = 1.0029x + 3.3571	0.9994
BKK_FS1166	02 Oct 23	Y = 1.061x - 56.83	1.0000
BKK_FS1200	02 Oct 23	Y = 1.2803x - 1.4599	0.9962
BKK_FS1201	02 Oct 23	Y = 1.0374x - 6.1952	1.0000
BKK_FS1202	02 Oct 23	Y = 1.0486x - 44.05	0.9997
PHK_FS0027	09 Oct 23	Y = 1.1052x + 1.0293	1.0000
PHK_FS0028	09 Oct 23	Y = 1.0377x - 1.9833	1.0000
PHK_FS0029	09 Oct 23	Y = 1.0021x + 7.5248	1.0000
RYG_FS0197	02 Oct 23	Y = 1.0036x + 9.0133	1.0000
RYG_FS0198	02 Oct 23	Y = 0.9991x + 17.568	1.0000
RYG_FS0199	02 Oct 23	Y = 1.0814x - 1.2993	0.9997
RYG_FS0654	02 Oct 23	Y = 1.1168x - 2.1207	1.0000
RYG_FS0655	02 Oct 23	Y = 1.0086x + 6.2733	0.9991
RYG_FS0656	02 Oct 23	Y = 1.0009x + 8.48	1.0000
RYG_FS0657	02 Oct 23	Y = 1.0435x + 2.6459	0.9999
RYG_FS0658	02 Oct 23	Y = 0.9788x + 10.283	0.9992
RYG_FS0659	02 Oct 23	Y = 1.0074x - 6.621	1.0000
SGK_FS0135	18 Oct 23	Y = 0.9831x + 14.843	0.9994
SGK_FS0138	06 Oct 23	Y = 1.0831x - 0.8401	0.9998
SGK_FS0139	06 Oct 23	Y = 0.9826x + 8.6567	1.0000
SGK_FS0140	06 Oct 23	Y = 1.0011x + 7.8095	1.0000
SGK_FS0141	06 Oct 23	Y = 1.125x - 1.2259	0.9998
SGK_FS0142	06 Oct 23	Y = 0.9956x + 10.257	0.9997
SGK_FS0143	06 Oct 23	Y = 1.004x + 3.3105	1.0000

Review By :

Wichan Choonharat
(Mr. Wichan Choonharat)

Enviro Field Services Manager

Approved By :

Mr. Sarayuth Jitranont
(Mr. Sarayuth Jitranont)

Assistant General Manager

Certificate of System Qualification

GC-OQ + GCMS-OQ

System ID: GM-2
Organization Name: ALS Laboratory Group (Thailand) Co., Ltd.
Organization Location: 104 Phatthanakan 40, Phattanakon Rd., Kheiwang Suan Luang, Khet Suan Luang, Bangkok 10250
Date: April 18, 2023 3:15:25 PM
EQP Name: AgilentRecommended, AgilentRecommended
EQP Revision: GC.02.51, GCMS.02.51
Overall Qualification Status: Pass

REVIEW BY Suchada T.
APPROVED BY Thanyasorn M.
NEXT CAL. DATE 18 Oct 24

System Inspection and Basic Safety and Operation

Name: 7890

Setpoint Status: Pass

Overall System Inspection and Basic Safety and Operation Test Status

Pass

Inlet Pressure Accuracy

Name: 7890
Front MMI
Setpoint Status: Pass
Setpoint Actual
Inlet Pressure: 25.0 psi 25.0 psi
Accuracy: 0.0 psi
Agilent Recommended: <= 1.2

Overall Inlet Pressure Accuracy Test Status

Pass

GC Oven Temperature Accuracy

Name: 7890

Date: April 18, 2023 3:15:25 PM
System ID: GM-2

Setpoint Status: Pass
Zone: Oven
Setpoint/Actual
Temperature: 230.0 230.1 °C
Accuracy: 0.1 °C
Agilent Recommended: >= -1.0 % setpoint in K (-5.0 °C)
<= 1.0 % setpoint in K (5.0 °C)

Setpoint Status: Pass
Zone: Oven
Setpoint/Actual
Temperature: 100.0 100.4 °C
Accuracy: 0.4 °C
Agilent Recommended: >= -1.0 % setpoint in K (-3.7 °C)
<= 1.0 % setpoint in K (3.7 °C)

Overall GC Oven Temperature Accuracy Test Status

Pass

GC Oven Temperature Stability

Name: 7890
Setpoint Status: Pass
Setpoint/Average
Temperature: 100.0 100.4 °C
Stability: 0.0 °C
Agilent Recommended: <= 0.5

Overall GC Oven Temperature Stability Test Status

Pass

Log Amp

Tested Combination1 Front MMI / External SQ
Name: 5975C Inert XL with TAD
Setpoint Status: Pass

Date: April 18, 2023 3:15:25 PM
System ID: GM-2

Overall Log Amp Test Status

Pass

RFPA

Tested Combination1

Front MMI / External SQ

Name:

5975C inert XL with TAD

Setpoint Status:

Pass

Amu: 1050 m/z

Drift After Five Minutes:

4 mV

RFPA Voltage:

441 mV

Agilent Recommended:

>= -100 and <= 100

<= 1100

Overall RFPA Test Status

Pass

Tune EI

Tested Combination1

Front MMI / External SQ

Name:

5975C inert XL with TAD

Setpoint Status:

Pass

Filament:

1

Setpoint Status:

Pass

Filament:

2

Overall Tune EI Test Status

Pass

Scouting Run

Tested Combination1

Front MMI / External SQ

Name:

7693A

Source:

EI - Inert

Date: April 18, 2023 3:15:25 PM
System ID: GM-2

Setpoint Status:

Completed

Injection Volume on Column:

1.0 uL

Overall Scouting Run Status

Completed

Signal to Noise EI

Tested Combination1

Front MMI / External SQ

Name:

5975C inert XL with TAD

Source:

EI - Inert

Filament:

1

Setpoint Status:

Pass

Signal to Noise:

456

Agilent Recommended:

>= 320

Source:

EI - Inert

Filament:

2

Setpoint Status:

Pass

Signal to Noise:

2034

Agilent Recommended:

>= 320

Overall Signal to Noise EI Test Status

Pass

Injection Precision

Tested Combination1

Front MMI / External SQ

Name:

7693A

Source:

EI - Inert

Setpoint Status:

Pass

Injection Volume on Column:

1.0 uL

Area RSD:

1.66 %

Retention Time RSD:

0.04 %

Agilent Recommended:

<= 5.00

<= 1.00

Overall Injection Precision Test Status

Pass

Date: April 18, 2023 3:15:25 PM
System ID: GM-2

Mass Ratio Precision

Tested Combination1

Front MMI / External SQ

Injection Tower

Name:

7693A

Source:

EI - Inert

Setpoint Status:

Pass

Injection Volume on Column:

1.0

uL

Area Mass 1

Mass Ratio

Abundance*s

RSD:

1.66

%

0.39

%

Agilent Recommended:

<= 5.00

<= 5.00

Pass

Pass

Overall Mass Ratio Precision Test Status

Pass

Instrument Details

Purpose

This section describes the as found system configuration.

Details

System

System ID	GM-2
Manufacturer	Agilent Technologies
Name	7890
Flow Data Input	Manual Data
Temperature Data Input	Manual Data or Other Data Logging

Tested Combination1

Injection Technique	Injection Tower
Inlet	Front
Detector	External
LTM Included?	No

Sampler 1

Manufacturer	Agilent Technologies
Type	Injection Tower
Name	7693A
Model Number	G4513A
Serial Number	CN10120123
Firmware Revision	A.10.08
Usage	Sample Injection
Location	Front
Syringe Volume (uL)	10

Sampler 2

Manufacturer	Agilent Technologies
Type	Tray
Name	7693A
Model Number	G4514A
Serial Number	CN10060099
Firmware Revision	A.10.16
Vial Heater	Not Installed

Mainframe 1

Manufacturer	Agilent Technologies
Name	7890
Model Number	G3440A
Serial Number	CN10141049
Firmware Revision	A.01.16
Oven Type	Standard

Inlet 1

Manufacturer	Agilent Technologies
Name	7890
Type	MMI
Location	Front
Carrier Gas	Helium
Control Type	Electronic Pressure Control (EPC)
Purged Inlet	Yes

Detector 1

Manufacturer	Agilent Technologies
Name	Mass Spectrometer
Type	Mass Spectrometer
Location	External

Mass Spectrometer 1

Manufacturer	Agilent Technologies
Type	SQ
Name	5975C inert XL with TAD
Serial Number	US10153217
Firmware Revision	5.02.12
High Vacuum System	Turbo Pump
Scouting Run Standard	OFN Std

MS EI Source 1

Manufacturer	Agilent Technologies
Source Type	EI - Inert
Number of filaments	2

Electronic Signature

Purpose

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Full Name of Signer: Supasak Nimsongtham
Logged On User Name: supasak.nimsongtham@agilent.com
Signature Creation Date: April 18, 2023
Reason for Signature: Executed protocol and published this original version of document

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Date: April 18, 2023 3:15:25 PM
System ID: GM-2

User Name: supasak.nimsongtham
Hostname: 5CG1115HKC

System ID: GM-2
Print Date: April 18, 2023 3:15:26 PM

ALS GM2 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 18, 2023 2:14:23 PM	Audit	SessionCreated	Session	None
April 18, 2023 2:14:23 PM	Start	Configuration	Session	None
April 18, 2023 2:14:23 PM	Audit	Entitlement	Licensing	User is FieldEngineer and does not require an unlock code
April 18, 2023 2:15:04 PM	Audit	EqpLoaded	Session	EQP details for primary technique (Gc) - File path: [ProtocolPacks\Gc\Configurations\02.51\Gc.02.51.eqp], EQP File Name: [Gc.02.51.eqp], EQP Name: [AgilentRecommended], Protocol Revision: [Gc.02.51] EQP details for hyphenated technique (GcMs) - File path: [ProtocolPacks\GcMs\Configurations\02.51\GcMs.02.51.eqp], EQP File Name: [GcMs.02.51.eqp], EQP Name: [AgilentRecommended]
April 18, 2023 2:15:07 PM	End	Configuration	Session	None
April 18, 2023 2:15:11 PM	Start	Qualification	Session	OQ
April 18, 2023 2:15:11 PM	Start	Execution	System Inspection and Basic Safety and Operation - 7890 - Qualitative Test - No setpoints associated	None
April 18, 2023 2:17:27 PM	End	Execution	System Inspection and Basic Safety and Operation - 7890 - Qualitative Test - No setpoints associated	Run Count: 1

Date: April 18, 2023 3:15:25 PM
System ID: GM-2

User Name: supasak.nimsongtham
Hostname: SCG1115HKC

System Id: GM-2
Print Date: April 18, 2023 3:15:30 PM

ALS GM2 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 18, 2023 2:17:28 PM	Start	Execution	Inlet Pressure Accuracy - Front MMI: - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	None
April 18, 2023 2:17:33 PM	End	Execution	Inlet Pressure Accuracy - Front MMI: - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	Run Count : 1
April 18, 2023 2:17:36 PM	Start	Execution	GC Oven Temperature Accuracy - 7890: - Temperature : Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	None
April 18, 2023 2:18:00 PM	Audit	Data	GC Oven Temperature Accuracy - 7890: - Temperature : Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Manual Data Entry
April 18, 2023 2:18:01 PM	End	Execution	GC Oven Temperature Accuracy - 7890: - Temperature : Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Run Count : 1
April 18, 2023 2:18:03 PM	Start	Execution	GC Oven Temperature Accuracy - 7890: - Temperature : Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	None
April 18, 2023 2:18:20 PM	Audit	Data	GC Oven Temperature Accuracy - 7890: - Temperature : Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Manual Data Entry
April 18, 2023 2:18:22 PM	End	Execution	GC Oven Temperature Accuracy - 7890: - Temperature : Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Run Count : 1
April 18, 2023 2:18:44 PM	Start	Execution	GC Oven Temperature Stability - 7890: - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	None

Page 2 / 7

Date: April 18, 2023 3:15:25 PM
System ID: GM-2

Page 11 / 16

User Name: supasak.nimsongtham
Hostname: SCG1115HKC

System Id: GM-2
Print Date: April 18, 2023 3:15:38 PM

ALS GM2 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 18, 2023 2:19:31 PM	Audit	Data	GC Oven Temperature Stability - 7890: - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	Manual Data Entry
April 18, 2023 2:19:33 PM	End	Execution	GC Oven Temperature Stability - 7890: - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	Run Count : 1
April 18, 2023 2:19:36 PM	Start	Execution	Log Amp - 5975C Inert XL with TAD SQ: - Source: EI - Inert	None
April 18, 2023 2:19:46 PM	End	Execution	Log Amp - 5975C Inert XL with TAD SQ: - Source: EI - Inert	Run Count : 1
April 18, 2023 2:19:49 PM	Start	Execution	RPPA - 5975C Inert XL with TAD SQ: - Source: EI - Inert	None
April 18, 2023 2:32:54 PM	End	Execution	RPPA - 5975C Inert XL with TAD SQ: - Source: EI - Inert	Run Count : 1
April 18, 2023 2:32:57 PM	Start	Execution	Tune EI - 5975C Inert XL with TAD SQ: - Source: - EI - Inert Filament 1 (Qualitative - No setpoints associated)	None
April 18, 2023 2:34:05 PM	End	Execution	Tune EI - 5975C Inert XL with TAD SQ: - Source: - EI - Inert Filament 1 (Qualitative - No setpoints associated)	Run Count : 1
April 18, 2023 2:34:07 PM	Start	Execution	Tune EI - 5975C Inert XL with TAD SQ: - Source: - EI - Inert Filament 2 (Qualitative - No setpoints associated)	None
April 18, 2023 2:34:20 PM	End	Execution	Tune EI - 5975C Inert XL with TAD SQ: - Source: - EI - Inert Filament 2 (Qualitative - No setpoints associated)	Run Count : 1

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Date: April 18, 2023 3:15:25 PM
System ID: GM-2

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User Name: supasak.nimsongtham
Hostname: SCG1115HKC

System ID: GM-2
Print Date: April 18, 2023 3:15:30 PM

ALS GM2 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 18, 2023 2:34:23 PM	Start	Execution	Scouting Run - Injection Tower, Front MMI, SQ: - Source: - EI - Inert- Part of GCMS System Preparation	None
April 18, 2023 2:34:56 PM	Audit	Data	Scouting Run - Injection Tower, Front MMI, SQ: - Source: - EI - Inert- Part of GCMS System Preparation	Data files Path : E:\GM-2 OQ2023\SNF1_001.D\DATA.MS
April 18, 2023 2:35:12 PM	End	Execution	Scouting Run - Injection Tower, Front MMI, SQ: - Source: - EI - Inert- Part of GCMS System Preparation	Run Count : 1
April 18, 2023 2:35:13 PM	Start	Execution	Signal to Noise EI - Injection Tower, Front MMI, SQ: - Source: EI - Inert using Filament 1 - L: >= 320	None
April 18, 2023 2:35:24 PM	Audit	Data	Signal to Noise EI - Injection Tower, Front MMI, SQ: - Source: EI - Inert using Filament 1 - L: >= 320	Data files Path : E:\GM-2 OQ2023\SNF1_001.D\DATA.MS
April 18, 2023 2:35:45 PM	End	Execution	Signal to Noise EI - Injection Tower, Front MMI, SQ: - Source: EI - Inert using Filament 1 - L: >= 320	Run Count : 1
April 18, 2023 2:35:47 PM	Start	Execution	Signal to Noise EI - Injection Tower, Front MMI, SQ: - Source: EI - Inert using Filament 2 - L: >= 320	None
April 18, 2023 2:35:52 PM	Start	Execution	Injection Precision - Injection Tower, Front MMI, SQ: - Source: - EI - Inert L (Area): <= 5.00% - L (Ret. Time): <= 1.00%	None

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Date: April 18, 2023 3:15:25 PM
System ID: GM-2

Page 13 / 16

User Name: supasak.nimsongtham
Hostname: SCG1115HKC

System ID: GM-2
Print Date: April 18, 2023 3:15:30 PM

ALS GM2 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 18, 2023 2:36:20 PM	Audit	Data	Injection Precision - Injection Tower, Front MMI, SQ: - Source: - EI - Inert L (Area): <= 5.00% - L (Ret. Time): <= 1.00%	Data files Path : E:\GM-2 OQ2023\IPMRPUP_MRP002.D\DATA.MS
April 18, 2023 2:36:20 PM	Audit	Data	Injection Precision - Injection Tower, Front MMI, SQ: - Source: - EI - Inert L (Area): <= 5.00% - L (Ret. Time): <= 1.00%	Data files Path : E:\GM-2 OQ2023\IPMRPUP_MRP003.D\DATA.MS
April 18, 2023 2:36:20 PM	Audit	Data	Injection Precision - Injection Tower, Front MMI, SQ: - Source: - EI - Inert L (Area): <= 5.00% - L (Ret. Time): <= 1.00%	Data files Path : E:\GM-2 OQ2023\IPMRPUP_MRP004.D\DATA.MS
April 18, 2023 2:36:20 PM	Audit	Data	Injection Precision - Injection Tower, Front MMI, SQ: - Source: - EI - Inert L (Area): <= 5.00% - L (Ret. Time): <= 1.00%	Data files Path : E:\GM-2 OQ2023\IPMRPUP_MRP005.D\DATA.MS
April 18, 2023 2:36:20 PM	Audit	Data	Injection Precision - Injection Tower, Front MMI, SQ: - Source: - EI - Inert L (Area): <= 5.00% - L (Ret. Time): <= 1.00%	Data files Path : E:\GM-2 OQ2023\IPMRPUP_MRP006.D\DATA.MS
April 18, 2023 2:36:21 PM	Audit	Data	Injection Precision - Injection Tower, Front MMI, SQ: - Source: - EI - Inert L (Area): <= 5.00% - L (Ret. Time): <= 1.00%	Data files Path : E:\GM-2 OQ2023\IPMRPUP_MRP007.D\DATA.MS
April 18, 2023 2:36:42 PM	End	Execution	Injection Precision - Injection Tower, Front MMI, SQ: - Source: - EI - Inert L (Area): <= 5.00% - L (Ret. Time): <= 1.00%	Run Count : 1
April 18, 2023 2:36:45 PM	Start	Execution	Mass Ratio Precision - Injection Tower, Front MMI, SQ: - Source: EI - Inert - L (RSD): <= 5.00%	None

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Date: April 18, 2023 3:15:25 PM
System ID: GM-2

Page 14 / 16

User Name: supasak.nimsongtham
Hostname: 5CG1115HKC

System Id: GM-2
Print Date: April 18, 2023 3:15:30 PM

ALS GM2 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 18, 2023 2:37:04 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MMI, SQ: - Source: EI - Inert - L (RSD): <= 5.00%	Data files Path : E:\GM-2 OQ2023\PMRP\IP_MRP002.D\DATA.MS
April 18, 2023 2:37:04 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MMI, SQ: - Source: EI - Inert - L (RSD): <= 5.00%	Data files Path : E:\GM-2 OQ2023\PMRP\IP_MRP003.D\DATA.MS
April 18, 2023 2:37:04 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MMI, SQ: - Source: EI - Inert - L (RSD): <= 5.00%	Data files Path : E:\GM-2 OQ2023\PMRP\IP_MRP004.D\DATA.MS
April 18, 2023 2:37:04 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MMI, SQ: - Source: EI - Inert - L (RSD): <= 5.00%	Data files Path : E:\GM-2 OQ2023\PMRP\IP_MRP005.D\DATA.MS
April 18, 2023 2:37:06 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MMI, SQ: - Source: EI - Inert - L (RSD): <= 5.00%	Data files Path : E:\GM-2 OQ2023\PMRP\IP_MRP006.D\DATA.MS
April 18, 2023 2:37:06 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MMI, SQ: - Source: EI - Inert - L (RSD): <= 5.00%	Data files Path : E:\GM-2 OQ2023\PMRP\IP_MRP007.D\DATA.MS
April 18, 2023 2:37:17 PM	End	Execution	Mass Ratio Precision - Injection Tower, Front MMI, SQ: - Source: EI - Inert - L (RSD): <= 5.00%	Run Count : 1
April 18, 2023 2:37:23 PM	Start	Execution	Signal to Noise EI - Injection Tower, Front MMI, SQ: - Source: EI - Inert using Filament 2 - L: >= 320	None

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Date: April 18, 2023 3:15:25 PM
System ID: GM-2

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User Name: supasak.nimsongtham
Hostname: 5CG1115HKC

System Id: GM-2
Print Date: April 18, 2023 3:15:30 PM

ALS GM2 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 18, 2023 2:56:38 PM	Start	Execution	Signal to Noise EI - Injection Tower, Front MMI, SQ: - Source: EI - Inert using Filament 2 - L: >= 320	None
April 18, 2023 2:57:00 PM	Audit	Data	DataManager	DataManager was in a data verification state but the user chose to start over
April 18, 2023 2:57:16 PM	Audit	Data	Signal to Noise EI - Injection Tower, Front MMI, SQ: - Source: EI - Inert using Filament 2 - L: >= 320	Data files Path : E:\GM-2 OQ2023\SNF2_003.D\DATA.MS
April 18, 2023 2:57:58 PM	Start	Execution	Signal to Noise EI - Injection Tower, Front MMI, SQ: - Source: EI - Inert using Filament 2 - L: >= 320	None
April 18, 2023 2:58:05 PM	End	Execution	Signal to Noise EI - Injection Tower, Front MMI, SQ: - Source: EI - Inert using Filament 2 - L: >= 320	Run Count : 1
April 18, 2023 3:01:14 PM	End	Qualification	Session	OQ
April 18, 2023 3:01:14 PM	Start	Reporting	Session	None
April 18, 2023 3:14:47 PM	Audit	Reporting	Session	Report Generated : Certificate

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Date: April 18, 2023 3:15:25 PM
System ID: GM-2

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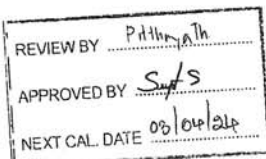
TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484



Cert.No.: 23CH442
Page.: 1 of 2

Certificate of Calibration

Equipment : pH Meter
Manufacturer : Mettler Toledo
Model : Seven2Go TM pH/mV S2
Serial No. : C202355606
ID No. : RYG_FS0574
Condition As-Received: Used Item
Received Date : 31 March 2023
Calibration Date : 03 April 2023
Reference : 2303-1133DSC-3
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 standard
voltage calibrator and direct measurement
with certified reference material (CRM)
Calibrated by : Warakorn Lernagatrakul
Approved by :
(/) Malee Butkruea
() Saithip Meangmai
() Warakorn Lernagatrakul
Issue Date : 5 April 2023



The Uncertainties are for a confidence probability of approximately 95%

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



Cert. No.: 23CH442
Page.: 2 of 2

Condition of this calibration result

1. Reference Standard Instrument : -

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	22E2769	24 Aug 2023

This certification is traceable to the International System of Unit maintained at:-
- Traceable to National Institute of Metrology (Thailand), NIMT

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 4.008	CPA chem	863832	28 Dec 2024
pH 6.987	CPA chem	826589	09 July 2023
pH 10.010	CPA chem	863835	28 Dec 2023

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 Fluke at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (±mV)	Coverage factor k
	pH	mV	mV	pH		
pH Meter S/N.: C202355606	4.00	177.48	177	4.00	0.58	2.00
	7.00	0.00	0	7.00	0.58	2.00
	10.00	-177.48	-178	10.00	0.58	2.00

Function : pH Measurement

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

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH measurement (±)	Coverage factor k
pH Electrode S/N.: 2015870	4.008	4.01	170	0.0071	2.00
	6.987	7.00	-5	0.011	2.00
	10.010	10.01	-181	0.0095	2.00

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

-o0o-

A 0052954

a 1156432



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. 0-2719-9454



Cert. No.: 23LM86
Page.: 1 of 2

Certificate of Calibration

Equipment : pH Meter with Sensor
Manufacturer : Mettler Toledo
Model : Seven2GoTM pH/mV S2
Serial No. : C202355606
ID No. : RYG_FS0574
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.
Rayong Branch
616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng,
Rayong 21140, Thailand
Location : TPA On Site Calibration Laboratory
Received Order : 31 March 2023
Calibrated Date : 05 April 2023
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V
Calibrated by : Preecha Hlahib

Approved by : 
Approved Signatory

() Pornthippa Tameyakul
(/) Malee Butkruea
() Suwit Imjai

Issue Date : 21 April 2023

The Uncertainties are for a confidence probability of approximately 95%

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



Equipment : pH Meter with Sensor
Condition As-Received : Used Item
Reference : 2303-1133DSC-4
Procedure Used :-

Cert. No.: 23LM86
Page.: 2 of 2

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	Model	Serial No.	Cert. No.	Due Date
1) Digital Thermometer	1502A	A52847	2211325	31 Oct 2023
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.				

Result of Calibration :- (*) Without Adjustment

Function : Temperature measurement.

This instrument was connected with temperature sensor, S/N.: 2015870

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
25.0	100	25.002	25.1	0.098	0.16	2.00
40.0	100	40.001	40.2	0.199	0.16	2.00
60.0	100	60.005	60.5	0.495	0.16	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 %.

-o0o-

A 0053338

a 1157393



RYG_EN0002

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6, e-mail: service.thailand@sartorius.com



SARTORIUS

REVIEW BY *Thana*
APPROVED BY *D. Inthana*
NEXT CAL. DATE *01/03/24*

Certificate of Calibration

Model Number : MSE224S-100-DU Certificate No. : 23BCI0112
Description : Analytical Balance Issued Date : Friday, March 03, 2023
Serial Number : 0026207038 Reference No. : 204833
ID No. : RYG_EN0002
Manufacturer : Sartorius Page No. : 1 of 2

Customer Name : ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Calibrated Place : ALS Laboratory Group (Thailand) Co., Ltd. (Balance Room)
616/10 Moo 5 T.Maenam Khu, A.Pluakdaeng, Rayong 21140, Thailand.

Calibrated By : Mr.Chonchai Inthana Calibration
Calibration Date : Wednesday, March 01, 2023 Procedure No. : This calibration was conducted by
Using in-house calibration procedure number (WI-003)
Based on UKAS LAB 14 : 2019

Metrological data : Capacity : 220 g Readability : 0.0001 g
Ambients Conditions: Temperature : 23.6 °C ± 5.0 °C
Humidity : 60.0 % RH ± 10.0 % RH
Pressure : - ± -
Reasons for calibration
☐ New Installation ☐ Service / Repaired ☒ Re-calibration/ Maintenance
Equipment Condition: ☒ Good Operate ☐ Fair

Measurement Method UKAS Publication Ref :Lab 14

The measurement uncertainty stated is the expended 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). The calibration certificate documents the traceability to National Standards, which realise the unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came from list of Sartorius Metrological Specifications.

Traceability:

Model Number	Description	Traceability	Certificate No.	Due Date
YCS011-522-00	Sartorius weight set 1mg - 5000g E2,YCS011-522-00	SPC-RT	C02212565	14-Sep-2023
MHB-382SD	Humidity/Barometer/Temp Lutron MHB-382SD	DKSH	C19220444	5-Sep-2023

This certificate relate and apply this equipment only.
This certificate may not be reproduced other than in full except with the prior written approval of the Verification Operation Division
Sartorius (Thailand) Co., Ltd.

Mr.chonchai Inthana(Technical Manager)

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SOP FM 33 03 February 2022

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Bangkok 10310
Tel: +66 2643 8361-6 Fax: +66 2643-8367, e-mail: service.thailand@sartorius.com

SARTORIUS

Certificate of Calibration

Model Number : MSE224S-100-DU Certificate No. : 23BCI0112
Description : Analytical Balance Issued Date : Friday, March 03, 2023
Serial Number : 0026207038 Reference No. : 204833
ID No. : RYG_EN0002
Manufacturer : Sartorius Page No. : 2 of 2

Calibration Results : Without Adjustment

Repeatability			Eccentricity (Off-center loading error)		
The reproducibility is the ability of a weighing instrument to display nearly identical readouts under constant test conditions when the same load within a measurement series is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express reproducibility quantitatively.			The off-center loading error is yielded by the difference between the readout of the load, i.e. 1/3 or 1/4 of maximim capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to OIML R76).		
Nominal Value : (Low Load)	20.0000	199.9999	Nominal value :	100	g
20 g	20.0000	200.0000	Tolerance	0.0004	g
Tolerance	20.0000	199.9999	 Difference		
0.0001 g	20.0000	200.0000			
Nominal Value : (High Load)			1	-	
200 g	20.0000	199.9999	2	-0.0001	
200 g	19.9999	200.0000	3	-0.0001	
Tolerance	20.0000	200.0000	4	0.0001	
0.0001 g	20.0000	199.9999	5	0.0002	
	20.0000	200.0000	6	-	
Standard Deviation	0.00003	0.00005			

Linearity

The linearity, also called linearity error. Describes the deviation of the characteristic curve of a weighing instrument from the linear slope.

Tolerance 0.0002 g				
Nominal Value	Conventional Mass Value	Displayed Value	Deviation	Uncertainty
(g)	(g)	(g)	(g)	(g)
0.01	0.0100	0.0100	0.0000	0.00014
0.05	0.0500	0.0500	0.0000	0.00014
0.1	0.1000	0.1000	0.0000	0.00014
0.5	0.5000	0.5000	0.0000	0.00014
1	1.0000	1.0000	0.0000	0.00014
5	5.0000	5.0000	0.0000	0.00014
10	10.0000	10.0001	0.0001	0.00014
20	20.0000	20.0000	0.0000	0.00024
50	50.0000	50.0000	0.0000	0.00015
100	100.0000	99.9999	-0.0001	0.00019
200	200.0000	200.0000	0.0000	0.00032

End of Report

SOP FM 33 03 February 2022



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-9000-27 FAX. 0-2719-9484



Cert. No.: 22TM1517
Page : 1 of 3

Certificate of Calibration

Equipment : Hot Air Oven
Manufacturer : Memmert
Model : UFE 500
Serial No. : G511.1572
ID No. : RYG_EN0010
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T. Maenam Khu,
A. Pluakdaeng,
Rayong 21140 Thailand
Location : Oven Room
Received Order : 20 October 2022
Calibration Date : 20 October 2022
Ambient Temperature : $(26 \pm 10) ^\circ\text{C}$
Relative Humidity : $(50 \pm 30) \%$
Calibrated by : Man Pattanapongpaiboon

REVIEW BY *Thantak*
APPROVED BY *Man*
NEXT CAL. DATE *30/04/24*

Approved by : *Man*
Approved Signatory

() Pornthippa Tameyakul
() Malee Butkruea
() Suwit Imjai

Issue Date : 2 November 2022

The Uncertainties are for a confidence probability of approximately 95%

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



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2210-03760C-2
Procedure Used :-

Cert. No.: 22TM1517
Page : 2 of 3

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

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Data Acquisition	34972A	MY49023932	22LM97	29 Jul 2023

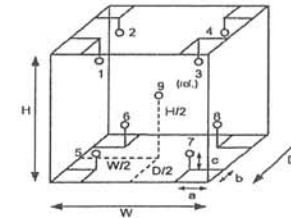
2. This certificate is valid only to the item calibrated on date and place of calibration.

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

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close



Environment during calibration		
	Beginning	Finished
Temp. (°C)	25	25
REL.Humid. (%)	54	59
AC Supply (Volt)	223	225

Probe Installation Details : Dimension of Chamber :
a = 5.0 cm D = 0.40 m
b = 5.0 cm W = 0.56 m
c = 5.0 cm H = 0.48 m
Capacity = 0.11 m³

Ref. Std. ID No.: @ Calibration Point		
Position :	(180) °C	(104) °C
1	21-16TC-01	20-16RTD-01
2	21-16TC-02	20-16RTD-02
3	21-16TC-03	20-16RTD-03
4	21-16TC-04	20-16RTD-04
5	21-16TC-05	22-16RTD-05
6	21-16TC-06	20-16RTD-06
7	21-16TC-07	20-16RTD-07
8	21-16TC-08	22-16RTD-08
9 (ref.)	21-16TC-09	22-16RTD-09



Equipment : Hot Air Oven
 Condition As-Received : Used Item
 Reference : 2210-03760C-2
 Result of Calibration :- (*) Without Adjustment
 Function of UUC* : Temperature Source
 Fresh air setting : Close

Cert. No.: 22TM1517
 Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Uncertainty (± °C)	Coverage Factor k
104.0	104.0	104.0	0.076	0.52	0.60	0.42	2
180.0	180.0	180.0	0.13	0.88	1.2	1.1	2

Calibration Point (°C)	Measured Temperature (°C)								
	Position								
	1	2	3	4	5	6	7	8	9 (ref.)
104.0	103.768	103.734	103.723	103.800	104.215	104.131	104.132	103.740	103.747
180.0	179.723	179.359	179.439	179.489	180.361	180.114	180.131	180.243	179.605

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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 TEL. 0-2717-7000-29 FAX. 0-2719-9181



Cert.No.: 23CH275
 Page.: 1 of 3

Certificate of Calibration

Equipment : pH Meter
 Manufacturer : Mettler Toledo
 Model : SevenCompact S220
 Serial No. : C104059460
 ID No. : RYG_EN0183
 Condition As-Received: Used Item
 Received Date : 24 February 2023
 Calibration Date : 27 February 2023
 Reference : 2302-0886DSC-2
 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 standard voltage calibrator and direct measurement with certified reference material (CRM)
 - CP-CH8 by comparison with standard thermometer

REVIEW BY	N. Bannit
APPROVED BY	D. Sathip
NEXT CAL DATE	27/2/24

Calibrated by : Walalak Sirithean

Approved by : Sathip
 Approved Signatory

() Malee Butkruea
 (✓) Sathip Meangmai
 () Warakorn Lerngagrakul

Issue Date : 28 February 2023
 The Uncertainties are for a confidence probability of approximately 95%

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

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Cert.No.: 23CH275
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	22E2769	24 Aug 2023
2) Ref. Standard Thermometer	4982054	110RC044	22I1306	27 Oct 2023

This certification is traceable to the International System of Unit maintained at:-
- Traceable to National Institute of Metrology (Thailand), NIMT

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 4.008	CPA chem	826588	09 July 2024
pH 6.987	CPA chem	826589	09 July 2023
pH 10.010	CPA chem	863835	28 Dec 2023

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 Fluke 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	177.4	4.000	0.058	2.00
	7.000	0.00	-0.1	7.000	0.058	2.00
	10.000	-177.48	-177.5	10.000	0.058	2.00

Saithip

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Cert.No.: 23CH275
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.: 1453404	4.008	4.008	179.1	0.0046	2.00
	6.987	6.988	4.7	0.0084	2.00
	10.010	10.013	-172.4	0.0069	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : InLabExpert Pro-ISM

- Serial No. : 1453404

Dimension of probe;

- Length : 120 mm.

- Diameter : 12 mm.

- Immersion Depth : 100 mm.

Calibration Point ($^{\circ}$ C)	Standard Temperature ($^{\circ}$ C)	UUC* Reading ($^{\circ}$ C)	Error ($^{\circ}$ C)	Uncertainty of measurement (\pm $^{\circ}$ C)	Coverage factor k
25.0	25.001	24.8	-0.201	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.: 23E753

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: 24 February 2023
Calibration Date: 28 February 2023
Reference: 2302-0886DSC
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)

616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng,
Rayong 21140, Thailand

Procedure used: Calibration were conducted using In-house calibration Procedure CP-E17 According to direct measurement method with Multi-Product Calibrator.

Condition of this result of calibration

1. Reference standards instruments:

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Multi-Product Calibrator	5500A	6440007	22E1670	18 May 2023

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

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

4. This Certification is traceable to the International System of Unit maintained at:-

-National Institute of Metrology Thailand (NIMT)

Calibrated by: Wutthareeporn Wongchutikrane
Issue Date: 02 March 2023

Approved Signatory:

[] Phalinee Prabpaipal
[x] Nuntawat Khamchai
[] Pornthippa Tameyakul

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Cert. No.: 23E753

Page.: 2 of 2

Result of calibration :- (*) Without adjustment () After adjustment

Function:	DC voltage measuremer	Range:	2000	mV	
	Standard Value	UUC* Reading	Error	Uncertainty	
	(mV)	(mV)	(mV)	(± μV)	
	-200.0000	-200.0	0.0	72	
	-150.0000	-150.0	0.0	69	
	-100.0000	-100.0	0.0	65	
	-50.0000	-50.0	0.0	62	
	0.0000	0.0	0.0	58	
	50.0000	50.0	0.0	62	
	100.0000	99.9	-0.1	65	
	150.0000	149.9	-0.1	69	
	200.0000	199.9	-0.1	72	

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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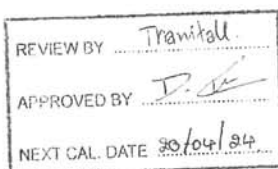
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Cert. No.: 22TM1492
Page : 1 of 3

Certificate of Calibration

Equipment : Hot Air Oven
Manufacturer : Memmert
Model : UM 400
Serial No. : b495.0899
ID No. : RYG_EN0006
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
616/10 Moo 5, T. Maenam Khu,
A. Pluakdaeng,
Rayong 21140, Thailand
Location : Oven Room
Received Order : 20 October 2022
Calibration Date : 20 October 2022
Ambient Temperature : $(26 \pm 10) ^\circ\text{C}$
Relative Humidity : $(50 \pm 30) \%$
Calibrated by : Preecha Hlahib
Approved by :
() Pornthippa Tameyakul
() Malee Butkruea
() Suwit Imjai



The Uncertainties are for a confidence probability of approximately 95%

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Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2210-0376OC-1
Procedure Used :-

Cert. No.: 22TM1492
Page : 2 of 3

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

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Data Acquisition	34970A	MY44035217	21LM30	23 Dec 2022

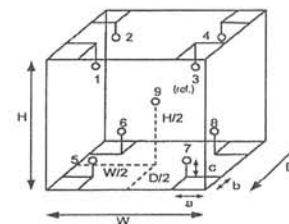
2. This certificate is valid only to the item calibrated on date and place of calibration.

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

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close



Probe Installation Details :

a = 5.0 cm
b = 5.0 cm
c = 5.0 cm

Dimension of Chamber :

D = 0.33 m
W = 0.40 m
H = 0.40 m
Capacity = 0.053 m³

Environment during calibration		
	Beginning	Finished
Temp. (°C)	28	29
REL.Humid. (%)	43	47
AC Supply (Volt)	220	221

Position :	Ref. Std. ID No.:
1	18-10RTD-01
2	18-10RTD-02
3	18-10RTD-03
4	18-10RTD-04
5	18-10RTD-05
6	18-10RTD-06
7	18-10RTD-07
8	18-10RTD-08
9 (ref.)	18-10RTD-09



Equipment : Hot Air Oven
 Condition As-Received : Used Item
 Reference : 2210-0376OC-1
 Result of Calibration :- (*) Without Adjustment
 Function of UUC* : Temperature Source
 Fresh air setting : Close

Cert. No.: 22TM1492
 Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Uncertainty (± °C)	Coverage Factor k
70.0	70.0	70.0	0.079	0.47	0.77	0.42	2

Calibration Point (°C)	Measured Temperature (°C)								
	Position								
	1	2	3	4	5	6	7	8	9 (ref.)
70.0	70.262	69.995	70.079	70.177	70.664	70.039	70.688	70.149	70.328

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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Cert. No.: 22TM1491
 Page : 1 of 3

Certificate of Calibration

Equipment : Water Bath
 Manufacturer : Memmert
 Model : WNB22
 Serial No. : L513.0648
 ID No. : RYG_EN0061
 Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
 616/10 Moo 5, T. Maenam Khu,
 A. Pluakdaeng,
 Rayong 21140, Thailand
 Location : Wet Chemistry Lab
 Received Order : 20 October 2022
 Calibration Date : 20 October 2022
 Ambient Temperature : (26 ± 10) °C
 Relative Humidity : (50 ± 30) %
 Calibrated by : Preecha Hlahib
 Approved by : Mlu.
 Approved Signatory
 () Pornthippa Tameyakul
 (/) Malee Butkruea
 () Suwit Imjai

REVIEW BY	Thanitale
APPROVED BY	<u>P.</u>
NEXT CAL. DATE	20/04/24

Issue Date : 2 November 2022

The Uncertainties are for a confidence probability of approximately 95%

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Mlu.



Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2210-0376OC-4
Procedure Used :-

Cert. No.: 22TM1491
Page : 2 of 3

Calibration were conducted using in-house calibration procedure CP-OT04 according to direct measurement method with Data Acquisition which connected with Industrial Platinum Resistance Thermometer (IPRT).

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Data Acquisition	34970A	MY44035217	21LM30	23 Dec 2022

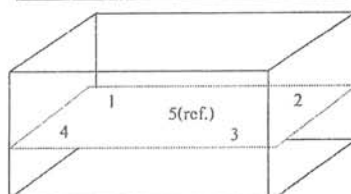
2. This certificate is valid only to the item calibrated on date and place of calibration.

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

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

	Environmental		AC Voltage Supply
	(°C)	(%R.H.)	(Volt)
Beginning of Calibration	24	53	222
Finished of Calibration	24	50	221



Front

Position :	Ref. Std. S/N.:
1	N37P300726
2	N37P300727
3	N37P300728
4	N37P300729
5(ref.)	N37P300730



Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2210-0376OC-4
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source

Cert. No.: 22TM1491
Page : 3 of 3

Calibration point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Average* Standard Reading (°C)				
			Position				
			1	2	3	4	5 (ref.)
85.0	85.0	85.0	84.527	84.563	84.628	84.516	84.580

Calibration point (°C)	Uniformity (°C)	Stability (± °C)	Uncertainty (± °C)	Coverage Factor k
85.0	0.12	0.081	0.18	2

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

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.

Stability : One-half of the greatest maximum difference of measured temperature at any one probe.

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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Automation Service Co.,Ltd. BK EN0066

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Lamphun Branch : 122/5 M.4, T.Ban Klang, A.Muang, Lamphun 51000 Tel/Fax. 053-581-876
website : www.automation.co.th

MTOC : L-0508/2023

Report No. : ALS-416/01

TOC-L Maintenance Report

Instrument : Total Organic Carbon Analyzer Measuring : TC 0 ~ 30000 mg/L
Model : TOC-LCSH Place of Installation : -
Serial No. : H54425300416 Department : LABORATORY
Manufacture : Shimadzu

Customer : ALS Laboratory Group (Thailand) Co.,Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khwaen Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand

Date of Maintenance : 11 / 05 / 2023

Ambient Condition : Temperature 25.5 ± 5 °C
Humidifier 56 ± 15 %RH

Maintenance By : Peerapong Sangpan
(Mr. Peerapong Sangpan)
Technician

Approved By : N. Phungsomsak
(Mr. Nipon Phungsomsak)
Technician Manager

User Name : Siriluk P.
(Siriluk Puengsang)

SHIMADZU ANALYZER
1/4



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website : www.automation.co.th

MTOC : L-0508/2023

Report No. : ALS-416/01

Maintenance Sheet

Customer : ALS Laboratory Date : 11 / 05 / 2023
Model : TOC-LCSH Serial No. H54425300416

Item	Carry out maintenance work	Result	Exchange	Comment
1.	Check functionality of the device			
	Check furnace temperature (Standard cat. 680 °C / for TN cat. 720 °C)	O.K.		
	Check dehumidifier temperature (1 °C)	O.K.		
	Check the entire flow line related to leakage	O.K.		
	Check baseline status (OK)	O.K.		
	Check carrier gas pressure (200 ±10 kPa)	O.K.		
	Check carrier gas flow rate (150 mL/min)	O.K.		
2.	Tubes			
	Check all tubing for contamination, if necessary clean them	O.K.		
	Check all tubing for tight connection	O.K.		
3.	Container and Drainage			
	Fill up humidifier with pure water to max. level	O.K.		
	Check filling of dilution water and acid container	O.K.		
	Rinse Drain Pot, after wards refill again with pure water	O.K.		
	Check if outlet flow is in proper conditions	O.K.		
4.	TC and IC Injection			
	Clean injector Block	O.K.		
	Check injector Block for wear	O.K.		
	Check injection tube adjustment	O.K.		
	Check injection for leakage	O.K.		
	Check injection for clogging	O.K.		
5.	IC Measurement (N-type)			
	Check acidification in syringe			
	Check sparging in syringe			
6.	Eye check of 8-Port valve, for sample residues or moist spots that indicate possible leakage	O.K.		
7.	Check and if necessary exchange consumable, Maintenance parts	O.K.		See list of consumable, maintenance parts

Inspection by : Peerapong Sangpan
(Mr. Peerapong Sangpan)
Technician

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2/4



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 website : www.automation.co.th

MTOC : L-0508/2023

Report No. : ALS-416/01

Item	Carry out maintenance work	Result	Exchange	Comment
8.	Due to instrument condition, clean the instrument inside and outside.	O.K.		
9.	After checking the system and exchanging of consumable and maintenance parts a new 1-3 point calibration have to be done.	O.K.		Addition test 1.
10.	After wards the calibration perform check sample measurement.	O.K.		Addition test 2.

Addition test

Test no.	Test conditions	Meas. value	Result
1.	Calibration TC standard solution at 0, 0.1, 0.5, 1, 5, 10, 20 injection volume 50 µL No. of measurement 2 times (Max.3)	1.0000	Attachment : ALS-416/02 Page 1/4 - 2/4
	Criteria : $R^2 = 0.995$ or more		Pass
2.	Measurement of reagent water and TC standard solution at 5.0 mg/L injection volume 50 µL No. of measurement 2 times (Max.3) and calculate accuracy by Meas. of TC standard – Meas. of Reagent water	5.202 – 0.2705 = 4.9315 ppm	Attachment : ALS-416/02 Page 3/4 – 4/4
	Criteria : Accuracy %Recovery 10% or less		Pass

Inspection by : Peerapong Sangpan
 (Mr. Peerapong Sangpan)
 Technician



Automation Service Co.,Ltd.

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 website : www.automation.co.th

MTOC : L-0508/2023

Report No. : ALS-416/01

List of Consumable, Maintenance parts

Pos.	Part Number	Part Name	Result	Exchange	Recommended Interval
1.	036-11209-84	O-ring, 4D P10A (Viton , for TC,IC Slider)	O.K.	✓	1 time per year, Depending on condition
2.	036-11219-84	O-ring, 4D P20 (for sealing TC-Combustion tube)	O.K.		1 time per year, Depending on condition
3.	638-15025	O-ring, PIFE (for TC,IC-Slider)	O.K.		1 time per year, Depending on condition
4.	630-00105-01	Platinum net, (2pcs-set) (to support catalyst)	O.K.		6 month same time as catalyst exchange
5.	630-00557	Silica Wool (to support catalyst)	O.K.		6 month same time as catalyst exchange
6.	630-00992	Halogen Scrubber	O.K.		6 month
7.	630-00996	High Sensitivity TC Catalyst (When installed)	N/A		Depending on condition
8.	638-60116	Regular Catalyst (33g) (When installed)	O.K.		6 month
9.	638-56251-01	8-Port valve rotor	O.K.		1 time per year
10.	638-41323	TC-Combustion Tube	O.K.		6 month same time as catalyst exchange
11.	631-43404-01	Packing, gasket slider (for TC-Injection tube)	O.K.		1 time per year, Depending on condition
12.	638-59296	Syringe 5mL	O.K.		Depending on condition
13.	638-59296-01	Plunger Tip (for syringe 5mL)	O.K.	✓	6 month
14.	042-00405-11	IC reagent supply pump head	O.K.		1 time per year
15.	630-00999	CO2-Absorber (for cell space purge)	O.K.		1 time per year
16.	630-00964	Molecular Sieves 13x	O.K.		1 time per year

Note. Table indicates the guidelines replacement periods when NPOC measurement is performed on sample that are comparatively as clean as tap water ,use standard catalyst and at a rate of about 500 sample per month (operating five days a week)

Inspector By : Peerapong Sangpan
 (Mr. Peerapong Sangpan)
 Technician

TOC-Control L Report

2023_05_11_001_PM_1_2.tlx

Instr. Information

Instrument Options
Catalyst

TOC/AS/IC Unit/
Regular Sensitivity

Cal. Curve

Sample Name:
Sample ID:
Cal. Curve:
Status

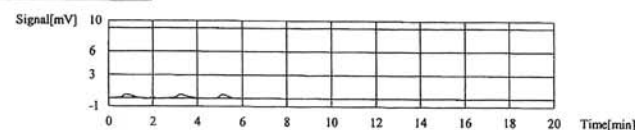
Untitled
Untitled
TC 0.1 - 20 ppm.2023_05_11_12_18_04.cal
Completed

Standard TC

Conc: 0.000mg/L

1	2.038	50uL	1.000	*****	E	5/11/2023 12:21:32 PM
2	1.285	50uL	1.000	*****		5/11/2023 12:23:32 PM
3	1.302	50uL	1.000	*****		5/11/2023 12:23:44 PM

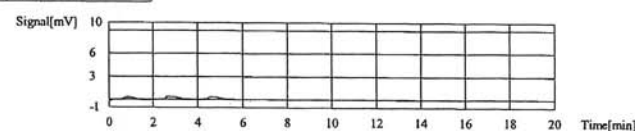
Acid Add. 0.000%
Mean Area 1.294
SD Area 0.01202
CV Area 0.93%



Conc: 0.1000mg/L

1	1.728	50uL	10.00	*****	E	5/11/2023 12:32:39 PM
2	1.414	50uL	10.00	*****		5/11/2023 12:35:28 PM
3	1.539	50uL	10.00	*****		5/11/2023 12:38:16 PM

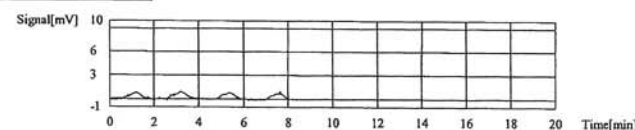
Acid Add. 0.000%
Mean Area 1.477
SD Area 0.08839
CV Area 5.99%



Conc: 0.5000mg/L

1	3.597	50uL	2.000	*****	E	5/11/2023 12:44:42 PM
2	3.821	50uL	2.000	*****	E	5/11/2023 12:47:13 PM
3	3.230	50uL	2.000	*****		5/11/2023 12:49:40 PM
4	3.262	50uL	2.000	*****		5/11/2023 12:51:54 PM

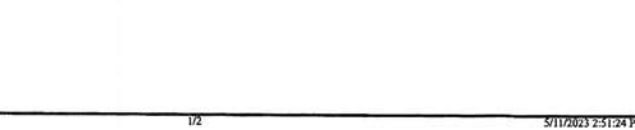
Acid Add. 0.000%
Mean Area 3.246
SD Area 0.02263
CV Area 0.70%



Conc: 1.000mg/L

1	3.597	50uL	2.000	*****	E	5/11/2023 12:44:42 PM
2	3.821	50uL	2.000	*****	E	5/11/2023 12:47:13 PM
3	3.230	50uL	2.000	*****		5/11/2023 12:49:40 PM
4	3.262	50uL	2.000	*****		5/11/2023 12:51:54 PM

Acid Add. 0.000%
Mean Area 3.246
SD Area 0.02263
CV Area 0.70%

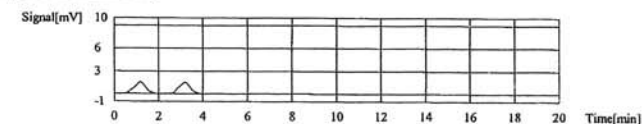


TOC-Control L Report

2023_05_11_001_PM_1_2.tlx

1	5.557	50uL	1.000	*****		5/11/2023 12:55:11 PM
2	5.433	50uL	1.000	*****		5/11/2023 12:57:34 PM

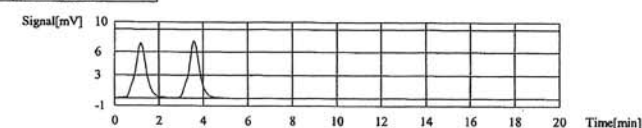
Acid Add. 0.000%
Mean Area 5.495
SD Area 0.08768
CV Area 1.60%



Conc: 5.000mg/L

1	24.52	50uL	4.000	*****		5/11/2023 1:04:59 PM
2	24.83	50uL	4.000	*****		5/11/2023 1:07:47 PM

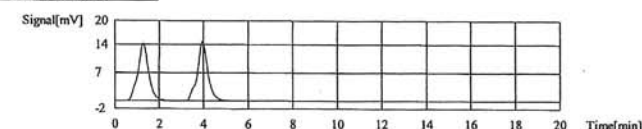
Acid Add. 0.000%
Mean Area 24.69
SD Area 0.2313
CV Area 0.95%



Conc: 10.00mg/L

1	48.44	50uL	2.000	*****		5/11/2023 1:14:25 PM
2	48.88	50uL	2.000	*****		5/11/2023 1:17:20 PM

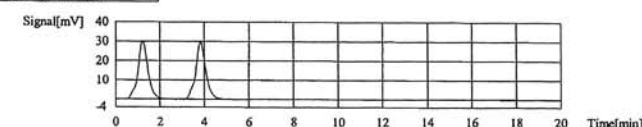
Acid Add. 0.000%
Mean Area 48.66
SD Area 0.3111
CV Area 0.64%



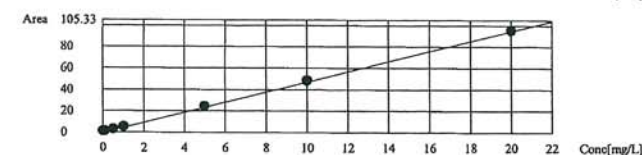
Conc: 20.00mg/L

1	95.93	50uL	1.000	*****		5/11/2023 1:21:31 PM
2	95.58	50uL	1.000	*****		5/11/2023 1:24:09 PM

Acid Add. 0.000%
Mean Area 95.75
SD Area 0.2475
CV Area 0.26%



Slope: 4.742
Intercept: 0.000
r^2: 1.0000
r: 1.0000
RSE(%): N/A
Zero Shift: Yes



TOC-Control L Report

2023_05_11_001_PM_1_2.txt

Instr. Information

Instrument Options
Catalyst

TOC/AS/IC Unit/
Regular Sensitivity

Sample

Sample Name:
Sample ID:
Origin:
Status
Chk. Result

TC_5
Untitled
TC 0.1 - 20 ppm.cal
Completed

Unknown	TC	1.000	TC:0.202mg/L
---------	----	-------	--------------

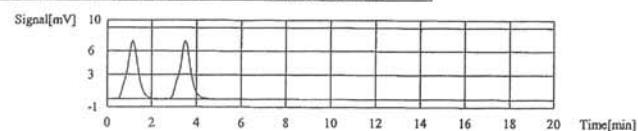
1. Det

Anal.: TC

Peak	Time [min]	Height [mV]	Area [mV]	Conc. [mg/L]	Cal	Date	Time
1	24.51	5.166	50.0	1.000	TC 0.1 - 20 ppm.2023_05_11_12_18_04.cal	5/11/2023	1:31:23 PM
2	24.83	5.238	50.0	1.000	TC 0.1 - 20 ppm.2023_05_11_12_18_04.cal	5/11/2023	1:34:59 PM

Mean Area
Mean Conc.

24.67
5.202mg/L



TOC-Control L Report

2023_05_11_001_PM_1_2.txt

Instr. Information

Instrument Options
Catalyst

TOC/AS/IC Unit/
Regular Sensitivity

Sample

Sample Name:
Sample ID:
Origin:
Status
Chk. Result

Water
Untitled
TC 0.1 - 20 ppm.cal
Completed

Unknown	TC	1.000	TC:0.2705mg/L
---------	----	-------	---------------

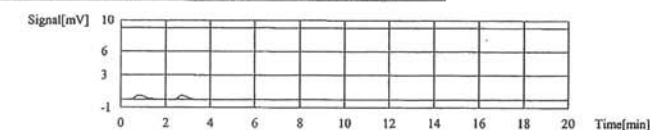
1. Det

Anal.: TC

Peak	Time [min]	Height [mV]	Area [mV]	Conc. [mg/L]	Cal	Date	Time
1	1.311	0.2765	50.0	1.000	TC 0.1 - 20 ppm.2023_05_11_12_18_04.cal	5/11/2023	1:44:28 PM
2	1.254	0.2644	50.0	1.000	TC 0.1 - 20 ppm.2023_05_11_12_18_04.cal	5/11/2023	1:46:41 PM

Mean Area
Mean Conc.

1.283
0.2705mg/L





Automation Service Co.,Ltd.

929,929/1 Soi Pattanakarn 30, Pattanakarn Rd., Suanluang, Suanluang, Bangkok 10250
Head Office : Tel. 02-319-9994 ext.1 Fax.02-318-4961 E-mail : atsc@automation.co.th
Rayong Branch : 1/15 Huaypong Rd., A. Muang, Rayong 21150 Tel. 038-692-152 Fax. 038-692-345
Lamphun Branch : 122/5 M.4, T.Ban Klang, A.Muang, Lamphun 51000 Tel/Fax. 053-581-876
website : www.automation.co.th

MTOC : L-0509/2023

Report No. : ALS-799/01

ASI Maintenance Report

Instrument : Automatic Sample Injector Measuring : Vial 40 mL
Model : ASI-L Place of Installation : -
Serial No. : H57415200799 Department : LABOLATORY
Manufacture : Shimadzu

Customer : ALS Laboratory Group (Thailand) Co.,Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khwaen Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand

Date of Maintenance : 11 / 05 / 2023

Ambient Condition : Temperature 25.5 ± 5 °C

: Humidifier 56 ± 15 %RH

REVIEW BY	<u>Sinluk P.</u>
APPROVED BY	<u>KL A</u>
NEXT CAL. DATE	<u>11/5/2024</u>

Maintenance By : Peerapong Sangpan
(Mr. Peerapong Sangpan)
Technician

Approved By : N. Phongsomsak
(Mr. Nipon Phongsomsak)
Technician Manager

User Name : Sinluk P.
(Mr. Sinluk Puengpang)

SHIMADZU ANALYZER
1/3



Automation Service Co.,Ltd.

929,929/1 Soi Pattanakarn 30, Pattanakarn Rd., Suanluang, Suanluang, Bangkok 10250
Head Office : Tel. 02-319-9994 ext.1 Fax.02-318-4961 E-mail : atsc@automation.co.th
Rayong Branch : 1/15 Huaypong Rd., A. Muang, Rayong 21150 Tel. 038-692-152 Fax. 038-692-345
Lamphun Branch : 122/5 M.4, T.Ban Klang, A.Muang, Lamphun 51000 Tel/Fax. 053-581-876
website : www.automation.co.th

MTOC : L-0509/2023

Report No. : ALS-799/01

Maintenance Sheet

Customer : ALS Laboratory Date : 11 / 05 / 2023
Model : ASI-L Serial No. H57415200799

Item	Carry out maintenance work	Result	Exchange	Comment
1.	Arm Drive section	O.K.		
	Check Arm Drive Belt for wear and tension	O.K.		
	Check grease of Screw Arm Drive	O.K.		
2.	Rinse pump (only ASI-V 24ml, 40ml)	O.K.		
	Check pump rate(>40mL/min)	O.K.		
	Check pump and tube connection for leakage	O.K.		
	Check if outlet flow is in proper condition	O.K.		
3.	Check and if necessary exchange consumable, Maintenance parts	O.K.		See appropriate list of maintenance parts
4.	Check Stirrer [When installed]	O.K.		
5.	Verify ASI function via mechanical check	O.K.		

Inspection by : Peerapong Sangpan
(Mr. Peerapong Sangpan)
Technician

SHIMADZU ANALYZER
2/3



Automation Service Co.,Ltd.

929,929/1 Soi Pattanakarn 30, Pattanakarn Rd., Suanluang, Bangkok 10250
Head Office : Tel. 02-319-9994 ext.1 Fax.02-318-4961 E-mail : atsc@automation.co.th
Rayong Branch : 1/15 Huaypong Rd., A. Muang, Rayong 21150 Tel. 038-692-152 Fax. 038-692-345
Lamphun Branch : 122/5 M.4, T.Ban Klang, A.Muang, Lamphun 51000 Tel/Fax. 053-581-876
website : www.automation.co.th

MTOC : L-0509/2023

Report No. : ALS-799/01

List of Consumable, Maintenance parts

Pos.	Part Number	Part Name	Result	Exchange	Recommended Interval
1.	017-27021-01	Grease Paste, Lubricant 100g	O.K.	✓	1 time per year
2.	032-22661-02	Belt, 60S2m596, Arm Drive	O.K.		1 time per year Depending on condition
3.	034-03067-02	Spring, F-642, Arm Drive	O.K.		Depending on condition
4.	042-00405-11	Pump Head, for ASI Rinse Pump (only ASI-V 24mL, 40mL)	O.K.		After 300 h of operating
5.	638-41448-01	Std. Needle Type1 24mL, 40mL* (for tube 2, 1x1, 6),[Sparge needle]	N/A		Depending on condition
6.	638-41448-02	Std. Needle Type1 125mL* (for tube 2, 1x1, 6)	N/A		Depending on condition
7.	631-41660-03	Flare Pipe 2x1,5x700mm* (for Standard Needle Type1 24mL,40mL, 125mL)	N/A		Depending on condition (may cut to origin length 600mm)
8.	638-41450-01	Needle for Suspended Particles,* 0,8mm (only ASI-V 24mL, 40mL)	N/A		Depending on condition
9.	638-41450-01	Std. Needle Type2 125mL* (for tube 1,4x0,9)	N/A		Depending on condition
10.	638-41472-01	Std. Needle Type2 24mL, 40mL* (for tube 1,4x0,9)	O.K.		Depending on condition
11.	631-41660-02	Flare Pipe 1,4x0,9x600mm* (for Suspended + Needle Type2)	O.K.		Depending on condition
12.	638-41449-01	Double Needle , only 24mL,40mL (simultaneous sparge type)*	N/A		Depending on condition
13.	631-41660-01	Flare Pipe 1,1x0,6x600mm* (for Double Needle 24mL,40mL)	N/A		Depending on condition

*Note: needed parts depending on installed needle types!

Inspection by : Peerapong Sangpan
(Mr. Peerapong Sangpan)
Technician

SHIMADZU ANALYZER
3/3



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)

CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES

534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250

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

Cert.No.: 23TW168

Page.: 1 of 2

Certificate of Testing

Equipment :	DO Meter
Manufacturer :	YSI
Model :	5000-115V
Serial No. :	15E102796
ID No. :	RYG_EN0032
Received Date :	21 July 2023
Test Date :	24 July 2023
Reference :	2307-0713DSC-1
Submitted by :	ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch 616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng, Rayong 21140, Thailand
Laboratory Condition :	Temperature (25 ± 5) °C Humidity (50 ± 20) %
Test Procedure :	In - house method : CP-CH9 by Comparison Technique with Azide Modification Method
Tested by :	Walalak Sirithean
Approved by :	<u>Saithip</u> Approved Signatory
	() Malee Butkruea (✓) Saithip Meangmai () Warakorn Lerngagtrakul

Issue Date : 26 July 2023

B 0320211



Cert.No.: 23TW168
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

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

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1) Burette	-	130BU10	23CG1172	22 Mar 2025
2) Balance	1126143764	140RC004	22MM50	20 Sep 2023

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate pentahydrate	Merck	AM1763316	100.2%

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)
8.18	8.17	0.0055

This report was certified only for the instrument we tested. It is allowable to use for study the system efficiency. The environmental impact control and present to organization it may concerned intend to use for advertising and referral purpose is prohibited. This report may not be reproduced other in full, without written approval of the laboratory

-o0o-

Saithip

a 1172155



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



Cert. No.: 23LM125
Page.: 1 of 2

Certificate of Calibration

Equipment : DO Meter with Sensor
Manufacturer : YSI
Model : 5000-115V
Serial No. : 15E102796
ID No. : RYG_EN0032
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd.
Rayong Branch
616/10 Moo 5 T. Maenam Khu, A. Pluakdaeng,
Rayong 21140 Thailand
Location : TPA On Site Calibration Laboratory
Received Order : 25 July 2023
Calibrated Date : 27 July 2023
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V
Calibrated by : Preecha Hlahib
Approved by :
Approved Signatory
() Pornthippa Tameyakul
() Malee Butkruea
(✓) Suwit Imjai
Issue Date : 31 July 2023

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.

A 0053616



Equipment : DO Meter with Sensor
 Condition As-Received : Used Item
 Reference : 2307-0713DSC-2
 Procedure Used :-

Cert. No.: 23LM125
 Page.: 2 of 2

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	2211285	TPA	21 Oct 2023

- This certificate is valid only to the item calibrated on date and place of calibration.
- 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.: 1228475367

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
20.00	100	20.011	19.91	-0.101	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 %.

-000-



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



Cert. No.: 23TM962
 Page : 1 of 3

Certificate of Calibration

Equipment : Low Temp. Incubator

Manufacturer : Memmert

Model : IPP750

Serial No. : V818.0084

ID No. : RYG_EN0154

Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.
 (Rayong Branch)
 616/10 Moo 5 T: Maenam Khu,
 A. Pluakdaeng, Rayong 21140 Thailand

Location : BOD Room

Received Order : 29 May 2023

Calibration Date : 29 May 2023

Ambient Temperature : (26 ± 10) °C

Relative Humidity : (50 ± 30) %

Calibrated by : Man Pattanapongpaiboon

Approved by :

[Signature]

Approved Signatory

() Pornthippa Tameyakul

() Malee Butkruea

(✓) Suwit Imjai

Issue Date : 7 June 2023

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.

a 1159515

A 0054967



Equipment : Low Temp. Incubator
 Condition As-Received : Used Item
 Reference : 2305-0898OC-2

Cert. No.: 23TM962
 Page : 2 of 3

Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD).

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Data Acquisition	34972A	MY57013711	22LM93	02 Jul 2023

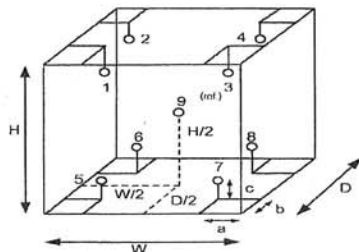
2. This certificate is valid only to the item calibrated on date and place of calibration.

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

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close



Environment during calibration		
	Beginning	Finished
Temp. (°C)	23	23
REL.Humid. (%)	54	56
AC Supply (Volt)	223	222

Position :	Ref. Std. ID No.:
1	18-18RTD-01
2	18-18RTD-02
3	18-18RTD-03
4	18-18RTD-04
5	18-18RTD-05
6	18-18RTD-10
7	18-18RTD-07
8	22-18RTD-08
9 (ref.)	18-18RTD-09

Probe Installation Details :

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

Dimension of Chamber :

D = 0.60 m
 W = 1.0 m
 H = 1.2 m
 Capacity = 0.75 m³

Signature

a 1165130



Equipment : Low Temp. Incubator
 Condition As-Received : Used Item
 Reference : 2305-0898OC-2
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Cert. No.: 23TM962
 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	0.019	0.72	1.0	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (± °C)
	Position									
	1	2	3	4	5	6	7	8	9 (ref.)	
20.0	19.547	19.780	19.487	19.529	19.408	20.139	20.112	20.406	20.116	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 %.

-o0o-

Signature

a 1165129



Certificate of Calibration

Certificate No.: C06220464

Page 2 of 3

Equipment: SPECTROPHOTOMETER
Model: DR8000
Serial No. (or ID.): 1627845 (RYG_EN0037)
Manufacturer: HACH
Condition: In Condition

Certificate No.: C06220464
Issued Date: 27 September 2022
Job No.: KSPR2212224
Page: 1 of 3

Customer: ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand.

REVIEW BY *N. Banerjee*
APPROVED BY *D. Pongngam*
NEXT CAL. DATE 27/3/24

Environment Condition: Temperature 23.1 °C ±
Humidity 65.4 %RH ±

Calibration Place: ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch) (Wet Chemistry)
616/10 Moo 5 T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand.

Calibration By: Mr. Chattuphon Folthong
Calibration Date: 27 September 2022
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. 91418 and 91435
The standard for Photometric Certificate No. 91441 and 101088
The standard for Stray light Certificate No. 101041 and 101040
The standard for Spectral resolution Certificate No. 101037

(Mr. Chattuphon Folthong)

Person in charge

(Mr. Thalemgkeat Pongngam)

Authorized signatory

This certificate is issued the units of measurement according to the International System of Units (SI). It provides traceability of measurement to international or national standard or other recognized national standard laboratories.

The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor ($k=2$) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM).

These results may be affected by deviations from specified conditions. The results relate only to the items tested, calibrated or sampled. The report shall not be reproduced except in full without approval of DKSH Technology Limited.

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DKSH Technology Limited
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Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/scientific-thailand

Delivering Growth - in Asia and Beyond.

CALFM-C06-13: 20 Jul 2022

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	418.4	0.21	0.14
536.66	536.7	-0.04	0.14
637.98	638.3	-0.32	0.14
748.48	748.8	-0.32	0.14
807.03	807.4	-0.37	0.13

Photometric Accuracy (Absorbance)

Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
	0.0000	0.000	0.0000	0.0045
420 nm	0.5605	0.563	-0.0025	0.0045
	0.7334	0.737	-0.0036	0.0045
	1.0534	1.057	-0.0036	0.0045
440 nm	0.0000	0.000	0.0000	0.0045
	0.5503	0.553	-0.0027	0.0045
	0.7179	0.720	-0.0021	0.0045
465 nm	1.0312	1.034	-0.0028	0.0045
	0.0000	0.000	0.0000	0.0045
	0.5024	0.506	-0.0036	0.0045
546.1 nm	0.6693	0.672	-0.0027	0.0045
	0.9604	0.964	-0.0036	0.0045
	0.0000	0.000	0.0000	0.0045
590 nm	0.5168	0.519	-0.0022	0.0045
	0.6903	0.691	-0.0007	0.0045
	0.9904	0.992	-0.0016	0.0045
635 nm	0.0000	0.000	0.0000	0.0045
	0.5525	0.554	-0.0015	0.0045
	0.7175	0.718	-0.0005	0.0045
	1.0301	1.031	-0.0009	0.0045
	0.0000	0.000	0.0000	0.0045
	0.5367	0.538	-0.0013	0.0045
	0.6847	0.685	-0.0003	0.0046
	0.9823	0.983	-0.0007	0.0045

บริษัท เทคโนโลยี ดีเคเอส เอช จำกัด
DKSH Technology Limited
2533 สุขุมวิท 10260 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10260
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ใบตรวจสอบสภาพเครื่องวัดสิ่งแวดล้อม

เลขที่ใบงาน: KSPR2212224

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
	0.7423	0.744	-0.0017	0.0083
257 nm	0.0000	0.000	0.0000	0.0080
	0.8609	0.861	-0.0001	0.0084
313 nm	0.0000	0.000	0.0000	0.0080
	0.2895	0.292	-0.0025	0.0080
350 nm	0.0000	0.000	0.0000	0.0080
	0.6381	0.638	0.0001	0.0080
Stray light *				
Standard: cut-off	UUC: Wavelength (nm)	UUC: Transmission (%T)	Absorbance (A)	
260.67 +/- 0.11 nm	260.7	2.1	1.678	
391.94 +/- 0.11 nm	391.9	1.7	1.770	
Spectral Resolution *				
Nominal Concentration 0.02 % v/v	Peak	Trough	Ratio	SBW
Standard Wavelength (nm)	268.60	266.63	1.39	2.00
UUC: Wavelength (nm)	268.2	266.1		
Std Absorbance (A)	0.4810	0.3176		
Absorbance (A)	0.373	0.268		

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

The End of Certificate

บริษัท ดีเคเอส อีซี จำกัด
DKSH Technology Limited
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ชนิดเครื่องมือ: SPECTROPHOTOMETER

รุ่น: DR8000

หมายเลขเครื่อง: 1627845

ตรวจสอบ (รับ)		รายการตรวจเช็ค	ตรวจสอบ (ส่ง)		หมายเหตุ
27 Sep 2022			27 Sep 2022		
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"/>	656.1 ได้ 656.1 nm
<input checked="" type="checkbox"/>	<input type="checkbox"/>	9. แหล่งกำเนิดแสง (UV $< 3,000$ hour)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	10. แหล่งกำเนิดแสง (Visible $< 5,000$ hour)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	11. ช่องวัดหลายตัวอย่าง (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. ฝาปิดกันปลาย Electrode (Dust Protection Hood)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	15. ขาจับอิเล็กโทรด (Stand)	<input type="checkbox"/>	<input type="checkbox"/>	
		Turbidimeter			
<input type="checkbox"/>	<input type="checkbox"/>	16. ค่าความขุ่นที่ต่ำสุด (No Sample)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	17. ระดับการส่องสว่างของแสง (≥ 2.5 ไม่นเกิน 3.0)	<input type="checkbox"/>	<input type="checkbox"/>	
		Automatic titrator			
<input type="checkbox"/>	<input type="checkbox"/>	18. สภาพ 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"/>	

เขียนด้วย/มอบหมายให้ :

Mr. Chatuphon Folthong
Service Engineer

บริษัท ดีเคเอส อีซี จำกัด
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ภาคผนวก จ

สำเนาหนังสือใบอนุญาตขึ้นทะเบียน
ห้องปฏิบัติการวิเคราะห์เอกชน

ที่ อก ๐๓๑๐(๑)/ ๑๐๖๕



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ เขตราชเทวี
กรุงเทพมหานคร ๑๐๕๐๐

๒๘ มกราคม ๒๕๖๕

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๓๐ กรกฎาคม ๒๕๖๓

- สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น
๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ แผ่น
๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุ
หนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔
ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร
ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย)
จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้
ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย ตามสิ่งที่ส่งมาด้วย ๑
ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๖๒ ราย ตามสิ่งที่ส่งมาด้วย ๒
ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๕๔ รายการ น้ำใต้ดิน
จำนวน ๑๒๖ รายการ อากาศเสีย ๑๖ รายการ สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน ๓๕ รายการ และดิน
จำนวน ๑๒๕ รายการ รวมทั้งสิ้นจำนวน ๓๖๑ รายการ ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ กันยายน ๒๕๖๖ หากประสงค์จะต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอ
ต่อกรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์
เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศิระ จันทร์เจ็ด)

นักวิทยาศาสตร์ชำนาญการพิเศษ วิชาการการแพทย์
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๒๐๒ ๔๑๔๖ ๐ ๒๒๐๒ ๔๐๐๒

โทรสาร ๐ ๒๓๕๔ ๓๒๐๘ ๐ ๒๓๕๔ ๓๔๑๕

เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย

- ๑) นางสาวยุพาพร จันทร์เปล่ง
๒) นางสาวจันนัย โกมารกุล ณ นคร
๓) นายศรายุทธ จิตรานนท์
๔) นางสาวกนกกร เอนก
๕) นายสุริยา สอนแก้ว
๖) นายวิชาญ ชูณหะวัณ

ทะเบียนเลขที่ ว-๒๐๔-ก-๔๗๐๐

ทะเบียนเลขที่ ว-๒๐๔-ก-๔๗๐๑

ทะเบียนเลขที่ ว-๒๐๔-ก-๔๗๐๒

ทะเบียนเลขที่ ว-๒๐๔-ก-๖๑๑๑

ทะเบียนเลขที่ ว-๒๐๔-ก-๖๑๑๒

ทะเบียนเลขที่ ว-๒๐๔-ก-๖๑๑๓

(นายศิระ จันทร์เจ็ด)

นักวิทยาศาสตร์ชำนาญการพิเศษ วิชาการการแพทย์

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

เอกสารแนบท้ายหนังสือรับคำอายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ ออก ๐๓๑๐(๑)/ ๑๐๖๕

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๖๒ ราย

๑) นางสาวจินดา ไชจุลธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๐๘
๒) นางสาวสวาทิรี น้อยเสงี่ยม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๐๘
๓) นางสาวชนัญญาญจน์ อัมมขม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๐
๔) นางสาวนรินทร์ สายเส็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๕
๕) นางสาวนันหวดี สมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๖
๖) นางสาวศรีธัญญา เกลิมธารังค์	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๗
๗) นางสาวสรารักษ์ มงคลจิรวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๘
๘) นางสาวศิริลักษณ์ พึ่งแพง	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๒๐
๙) นายพนพงศ์ จันทร์พันธุ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๕๐๘
๑๐) นายธนเศรษฐ์ โกมลาลัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๕๑๑
๑๑) นายธันวา จริยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๕๑๔
๑๒) นางสาวเกศรินทร์ แก้วมัน	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๕๑๖
๑๓) นางสาวสุวิมล ชัยเรืองวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๕๑๗
๑๔) นางสาวสุชาดา ธรรมถาวร	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๕๑๑
๑๕) นางสาวเปมิกา ชัยเดชธนกุล	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๕๑๓
๑๖) นางสาวศศิธร หมูสวัสดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๕๑๔
๑๗) นางสาวเสาวลักษณ์ ภูณภำพร	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๕๑๕
๑๘) นายอภิสิทธิ์ สิงหา	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๕๑๖
๑๙) นายศักดิ์สิทธิ์ ไพศาลพิสุทธิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๕๑๗
๒๐) ว่าที่ร้อยตรีหญิง พรรณีภา จำเจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๕๑๘
๒๑) นางจิตตา คำแก้ว	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๕๑๑
๒๒) นางสาวอรรณณ รักยง	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๑๕
๒๓) นางสาวนพรัตน์ แยมกรานต์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๑๘
๒๔) นายจุลเดช วารินทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๐
๒๕) นางสาวดาญรัตน์ ร้องคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๑
๒๖) นายนคร สุขเจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๒
๒๗) นายบุญข้า นามเขตต์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๓
๒๘) นายพรมมี ศรีปิตเนตร	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๕
๒๙) นายอุทิศ อุ่นลิ้ม	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๖
๓๐) ว่าที่ร้อยตรี เฉลิมเกียรติ อมรศรีเสริม	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๘
๓๑) นางสาววริยา สร้างนา	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๙
๓๒) นายอนุพงศ์ รัตนศรีประเสริฐ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๓๐
๓๓) นางสาวจุฑารัตน์ โอนสันทียะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๒๓๐
๓๔) นางสาวจารุวรรณ พิมพ์อิลกฤติยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๖๖

(นายศิระ จันทร์เกิด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน
ผู้อำนวยการกองวิจัยและเทียบเคียงห้องปฏิบัติการ
ปตท.ปิโตรเลียมปิโตรเคมีและปิโตรแก๊ส

๓๕) นางสาวปรางค์ทิพย์...

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๓๕) นางสาวปรางค์ทิพย์ กิจไพศาลศักดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๗๔
๓๖) นางสาวเดือนใจ ทางกลาง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๐
๓๗) นางสาวจิราพร ศิริเวช	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๒
๓๘) นายวรกร ผูกกรัก	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๓
๓๙) นายทอง วิริยะสหกิจ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๔
๔๐) นายธนิศ เจนจบ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๕
๔๑) นายคณิตร ข้าเพชร	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๖
๔๒) นายอรรถพล นิยมวิทยาพันธ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๗
๔๓) นายภูวิช พรหมสะอาด	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๘
๔๔) นายธนเดช โกคาพิพัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๙
๔๕) นายชวฤทธิ์ วงษ์จันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๐
๔๖) นายอาทิตย์ ศรีเสน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๑
๔๗) นายเจตดินทร์ คงศักดิ์ไทย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๒
๔๘) นายจรัส บุญย้ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๕
๔๙) นายธนาณัติ เอนก	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๖
๕๐) นายอภิวัฒน์ ทุมหนู	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๗
๕๑) นางสาวสุภาขวัญ มาก	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๘
๕๒) นางสาวหัตถพร ขวาลสมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๐
๕๓) นางสาวธิดิมา บุญเพ็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๑
๕๔) นางสาวกนกอร เข้มเพ็ชร	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๒
๕๕) นางสาวพัชรียา หงษ์สมดี	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๓
๕๖) นางสาวภาณิดา สุรวงศ์ตระกูล	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๔
๕๗) นางสาวภาณุมาศ นามวัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๕
๕๘) นางสาวอุไรรัตน์ ทั้งสร้างแป้น	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๖
๕๙) นายธีรวัฒน์ ปางสุข	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๗
๖๐) นายอิทธิพล ยะโส	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๘
๖๑) นายประพนธ์ วรรณชูชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๙
๖๒) นายชยธร พวงทิพย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๐
๖๓) นางสาวกนกวรรณ จันทบาล	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๑
๖๔) นางสาวเกษร หลีกบุญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๒
๖๕) นายสิทธิโชค ธงเงิน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๓
๖๖) นางสาววรรณใจ บุญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๕
๖๗) นางสาวพรรณธิดา ทุมคง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๘
๖๘) นางสาวศรณีย์ ยิ่งดี	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๙
๖๙) นายนวกัทร ศรีวิริยะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๐
๗๐) นายสุวิชา ทองอ่อน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๑
๗๑) นายวิญญู บุญตะนัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๓

(นายศิระ จันทร์เกิด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน
ผู้อำนวยการกองวิจัยและเทียบเคียงห้องปฏิบัติการ
ปตท.ปิโตรเลียมปิโตรเคมีและปิโตรแก๊ส

๗๒) นายสมบูรณ์...

๗๒) นายสมบุรณ์ บุตรจันทร์
๗๓) นายวิรัตน์ ไชยชนะรา
๗๔) นายณฤเบศน์ เพิ่มพูน
๗๕) นายจิรณัฐ ขาวละออ
๗๖) นายสมโภช วันสา
๗๗) นายอัสรี นามบุรี
๗๘) นายณัฐนันท์ ปานประเสริฐ
๗๙) นายอัครเวศ จอสา
๘๐) นายประเสริฐ สุระขันธุ์
๘๑) นายบุญถ จันทรเนียม
๘๒) นายพีรพงษ์ ทองคุณปรีดา
๘๓) นายณฤพล ทองนุช
๘๔) นายอนุวัฒน์ ม่วงแพร่
๘๕) นายเจตศราวุฒิ ปิตตะมะ
๘๖) นายกฤษณะ สายวรรณ
๘๗) นายพิชัย บุญยงค์
๘๘) นายภาณุพงศ์ โยมวงศ์
๘๙) นายสามารถ คุ้มปลี
๙๐) นายสัญญา โศทรินาม
๙๑) นายณัฐวุฒิ ศรีประเสริฐ
๙๒) นายชวลิตชัย นาคพนม
๙๓) นายพงศธร ชัยทิพย์
๙๔) ว่าที่ร้อยตรี ภาณุพงศ์ แสนศรี
๙๕) นายสิทธิโชค ทาสีดา
๙๖) นายธนากร อินสุตา
๙๗) นางสาววรรณิษา ขาดวันชัย
๙๘) นางสาวพิมพ์ตะวัน มินาภู
๙๙) นางสาวเพชรรัตน์ สิงห์สมบุญ
๑๐๐) นางสาวชญานิษฐ์ พรหมจันทร์
๑๐๑) นายเกียรติ หวีราช
๑๐๒) นายจักริน หมั่นวิชา
๑๐๓) นายฉัตรชัย สุขเปี้ย
๑๐๔) นายณรณนที ต๊ะทองคำ
๑๐๕) นายศุภยพล สมนอก
๑๐๖) นายทักษิณีย์ อุบลศรี
๑๐๗) นายธนศร นามะกุลณา
๑๐๘) นายอดิพงษ์ บัวแดง

ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๔
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๕
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๖
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๗
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๘
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๙
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๐
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๑
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๒
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๓
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๔
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๕
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๖
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๗
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๘
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๙
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๐
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ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๒
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๓
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๔
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๖
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๗
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๘
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๙
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๐
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๑
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๒
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๓

(นายศิระ จันทรเจ็ด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปกติพิจารณาการแทนที่เมื่อจำเป็น

๑๐๙) นายณนทชัย...

๑๐๙) นายณนทชัย อุปลัมภ์
๑๑๐) นายณัฐพล คุณสุทธิ
๑๑๑) นายณันท์วัฒน์ สาริน
๑๑๒) นายปิยะนัฐ พลมะศรี
๑๑๓) นายพงศ์สิริ โสมเขียว
๑๑๔) นายพีรพัฒน์ กำคำ
๑๑๕) นายภาณุพงศ์ มานิตย์
๑๑๖) นายมงคล ผลาพิทย
๑๑๗) นายณินันท์ พูลศิริ
๑๑๘) นายสิรินันท์ ทองอิน
๑๑๙) นายอนนา ทนสมัย
๑๒๐) นายอดิศักดิ์ สมไผ
๑๒๑) นายอนันตชัย วิสม
๑๒๒) นายณัฐดนัย เจือละออง
๑๒๓) นายวรวิฑูรย์ คีนัก
๑๒๔) นายแสงตะวัน นະตะสัต
๑๒๕) นายยุทธพงศ์ รัตนะ
๑๒๖) นายชัยวุฒิ ไชยชนะ
๑๒๗) นายวิศรุต ศรีธรรมมา
๑๒๘) นายณนทกร เผือกผ่อง
๑๒๙) นายกำชัย สุทธะ
๑๓๐) นางสาวณัฐภรณ์ รักทะเล
๑๓๑) นางสาวประภาภรณ์ บุตรพรม
๑๓๒) นางสาวนิลาวัลย์ นามพรม
๑๓๓) นางสาวพัชรินทร์ แสนสร้อย
๑๓๔) นายไพโรจน์ เปี่ยมพิมาย
๑๓๕) นางสาวศุภมาศ ทองมาก
๑๓๖) นางสาวลลิตา จิตรสว่าง
๑๓๗) นางสาวไมพร เล็กภูเขียว
๑๓๘) นางสาวกฤติมาพร คำมีแก่น
๑๓๙) นางสาวสุกฤษรัตน์ ภาณุภูมิ
๑๔๐) นางสาวกาญจนา คงคุณ
๑๔๑) นางสาวไพรินทร์ ศรีรูป
๑๔๒) นางสาวทิพนันทร ฝอยปัญญา
๑๔๓) นางสาวสาธิตา ปานทอง
๑๔๔) นางสาวอริสา ทองนวล
๑๔๕) นางสาวอรยา คำคล่อง

ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๔
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๕
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๖
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๗
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๘
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ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๐๐
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๐๑
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๐๒
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๐๓
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๐๔
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๐๕
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๐๖
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๐๗
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๐๘
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ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๑๑
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๑๒
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๑๓
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๑๔
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๑๕
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๑๖
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๑๗
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๑๘
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๑๙
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๒๐
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๒๑
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๒๒
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๒๓
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๒๔
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๒๕
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๒๖
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๒๗
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๒๘
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๒๙
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๓๐
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๓๑
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๓๒
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๓๓
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๖๓๔

(นายศิระ จันทรเจ็ด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปกติพิจารณาการแทนที่เมื่อจำเป็น

๑๔๖) นางสาวสุภาภรณ์...

๑๔๖) นางสาวชุตานันท์ สุนทรสนาน	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๓๕
๑๔๗) นางสาวสุตารัตน์ นนทประสาท	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๓๖
๑๔๘) นางสาวรัชนิกร เนียมกลาง	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๓๗
๑๔๙) นางสาวกัญญารัตน์ ศรีนิลทา	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๓๘
๑๕๐) นางสาวอัญชลี คำจันทร์	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๓๙
๑๕๑) นายบุญฤทธิ์ เอี่ยมเทศ	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๔๐
๑๕๒) นายศิริวัฒน์ พานิชย์	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๔๑
๑๕๓) นางสาวศุภรดา ปันมยุรา	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๔๒
๑๕๔) นางสาวพาดิ ศุภนนาน	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๔๓
๑๕๕) นางสาวจิราเจต พงศา	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๔๔
๑๕๖) นางสาวกนกภรณ์ อูระ	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๔๕
๑๕๗) นางสาวอารยา มีชัย	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๔๖
๑๕๘) นางสาวจิตสุภา ประเทืองสุข	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๔๗
๑๕๙) นางสาวอริสา วิริยขันติธรรม	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๔๘
๑๖๐) นางสาววิชุดา นาคผจญ	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๔๙
๑๖๑) นางสาวพนิดา ยอดอินทร์	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๕๐
๑๖๒) นางสาวนันทยา จันทะสุน	ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๒๕๑



(นายศิริระ จันทะสุน)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน
ผู้อำนวยการกองวิจัยและเฝ้าระวังมลพิษ
ปฏิบัติงานราชการ ณ ห้องปฏิบัติการโรงงานอุตสาหกรรม

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุป (ประเทศไทย) จำกัด

เลขทะเบียน ๖-๒๐๔

ที่ อก ๐๓๑๐(๑)/ ๑๐๖๔

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๖๑ รายการ

น้ำเสีย จำนวน 59 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldicarb	High-Performance Liquid Chromatographic Method ⁽⁴⁾
2	Aldicarb Sulfone	High-Performance Liquid Chromatographic Method ⁽⁴⁾
3	Aldicarb Sulfoxide	High-Performance Liquid Chromatographic Method ⁽⁴⁾
4	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
5	Arsenic	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
6	Barium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
7	α-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
8	β-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
9	δ-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
10	γ-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
11	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method ⁽⁴⁾ 2) 5-Day BOD Test, Membrane Electrode Method ⁽⁴⁾
12	Carbaryl	High-Performance Liquid Chromatographic Method ⁽⁴⁾
13	Carbofuran	High-Performance Liquid Chromatographic Method ⁽⁴⁾
14	Cadmium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
15	Chemical Oxygen Demand	1) Closed Reflux, Colorimetric Method ⁽⁴⁾ 2) Closed Reflux, Titrimetric Method ⁽⁴⁾
16	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
17	Chromium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁴⁾
18	Color	ADMI Weighted-Ordinate Spectrophotometric Method



(นางจิราญจน์ จิตตสุกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

19 Copper...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
19	Copper	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
20	Cyanide	Distillation, Colorimetric Method ⁽⁴⁾
21	2,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
22	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
23	2,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
24	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
25	2,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
26	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
27	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
28	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
29	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
30	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
31	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
32	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
33	Formaldehyde	Distillation, Colorimetric Method ⁽³⁾
34	Free Chlorine	1) DPD Ferrous Titrimetric Method ⁽⁴⁾ 2) Iodometric Method ⁽⁴⁾
35	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
36	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
37	Hexavalent Chromium	Filtration, Colorimetric Method ⁽⁴⁾
38	3-Hydroxycarbofuran	High-Performance Liquid Chromatographic Method ⁽⁴⁾
39	Lead	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
40	Manganese	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
41	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/Mass spectrometric Method ⁽⁴⁾
42	Methiocarb	High-Performance Liquid Chromatographic Method ⁽⁴⁾
43	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾

วิมล
(นางริกาญจน์ ฉัตรสกุลวิไล)
ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
.....เป็นต้นฉบับปฏิบัติการ

44 Methomyl...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
44	Methomyl	High-Performance Liquid Chromatographic Method ⁽⁴⁾
45	Nickel	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
46	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method ⁽⁴⁾ 2) Soxhlet Extraction Method ⁽⁴⁾
47	Oxamyl	High-Performance Liquid Chromatographic Method ⁽⁴⁾
48	Propoxur	High-Performance Liquid Chromatographic Method ⁽⁴⁾
49	pH	Electrometric Method ⁽⁴⁾
50	Phenols	1) Distillation, Chloroform Extraction Method ⁽⁴⁾ 2) Distillation, Direct Photometric Method ⁽⁴⁾
51	Selenium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
52	Sulfide	Iodometric Method ⁽⁴⁾
53	Temperature	Laboratory and Field Methods ⁽⁴⁾
54	Total Dissolved Solids	Dried at 180 °C ⁽⁴⁾
55	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method ⁽⁴⁾
56	Total Suspended Solids	Dried at 103-105 °C ⁽⁴⁾
57	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
58	Trivalent Chromium	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ⁽⁴⁾
59	Zinc	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁴⁾

น้ำใต้ดิน จำนวน 126 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾

วิมล
(นางริกาญจน์ ฉัตรสกุลวิไล)
ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
.....เป็นต้นฉบับปฏิบัติการ

3 Aldrin...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
8	Barium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
9	Benz(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
13	Benzoic Acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
15	Benzo[g,h,i]perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾

วิมล
(นางวิภาณูจน์ อัครสกุลวิไล)
ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
กรมควบคุมมลพิษ


18 Bis(2-ethylhexyl)phthalate...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾ Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
22	Butyl Benzyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
27	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾

วิมล
(นางวิภาณูจน์ อัครสกุลวิไล)
ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
กรมควบคุมมลพิษ


34 Chromium (III)...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ⁽⁴⁾
35	Chromium (VI)	Colorimetric Method ⁽⁴⁾
36	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
37	Cyanide	Distillation, Colorimetric Method ⁽⁴⁾
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
39	DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
40	DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
41	DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
42	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
43	Di-n-Butyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
47	3,3-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾


 (นางวิภาญจน์ ฉัตรสกุลวิไล)
 ผู้อำนวยการศูนย์มาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
 กรมควบคุมมลพิษ

51 cis-1,2-Dichloroethylene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
57	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
58	Diethyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
63	Di-n-Octyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
64	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
65	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾


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
68 Fluorene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
69	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
70	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
74	α -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
75	β -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
76	γ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
81	Lead	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
83	Mercury	1) Cold Vapor Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾


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84 Methanol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾ 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
95	N-Nitrosodi-n-Propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB 1242 - PCB 1248 - PCB 1254 - PCB 1260	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾


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97 Pentachlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
98	pH	Electrometric Method ^[4]
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
100	Phenol	1) Distillation, Direct Photometric Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
102	Selenium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
103	Silver	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
104	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
105	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
106	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
107	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
108	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
109	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,24]
110	TPH (C ₈ -C ₁₆)	Solvent Extraction, Gas Chromatographic Method ^[9,21]
111	TPH (C ₁₆ -C ₃₅)	Solvent Extraction, Gas Chromatographic Method ^[9,21]
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]

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114 1,1,2-Trichloroethane...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
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 ^[4] 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 ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]

อากาศเสีย (ปล่อยระบาย) จำนวน 16 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
2	Arsenic	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]

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3 Carbon Monoxide...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
3	Carbon Monoxide	1) Sampling Bag Non-Dispersive Infrared Method ^[5] 2) Non-Dispersive Infrared Method ^[5] 3) Instrumental Analyzer Method ^[5]
4	Chlorine	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
5	Copper	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
6	Dioxins	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory or Analysis by Department of Industrial Works Registered Laboratory (Dioxins/Furans Analysis Approved) ^[5]
7	Hydrogen Chloride	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
8	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[5]
9	Lead	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
10	Mercury	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[5] 2) Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
11	Opacity	Ringelmann's Method ^[2]
12	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ^[5] 2) Chemiluminescence Method ^[5] 3) Instrumental Analyzer Method ^[5]
13	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ^[5] 2) UV Fluorescence Method ^[5] 3) Instrumental Analyzer Method ^[5]
14	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ^[5]
15	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[5]
16	Xylene	Adsorption Sampling, Gas Chromatographic Method ^[5]

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สิ่งปฏิกูล...


สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]

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และทะเบียนสิ่งปฏิกูล


6 Cadmium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,19,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
9	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1,6,15,17) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1,6,16,17) 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7,8,15,17) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7,8, 16,17)
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^(1,6,17) 2) Alkaline Digestion, Colorimetric Method ^(8,17)


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11 Cobalt...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25)


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2) Soxhlet...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31) 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25)
18	Endrin	2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31) 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25)
19	Heptachlor	2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31) 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25)
20	Lead	2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31) 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(1,6,18)

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2) Waste Extraction...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
23	Methoxychlor	2) Waste Extraction, Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ^(1,6,19) 3) Waste Extraction, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^(1,6,20) 4) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽¹⁸⁾ 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ⁽¹⁹⁾ 6) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽²⁰⁾
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
25	Molybdenum	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31) 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
26	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)

วิมล

27 Polychlorinated...

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
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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,3-Dichlorobiphenyl - 2,2',5-Trichlorobiphenyl - 2,4',5-Trichlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5'-Pentachlorobiphenyl - 2,3,3',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	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(1,9,23) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,23) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)


 (นางกัญญา นงกัญญา)
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28 Pentachlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
29	pH	Electrometric Method ^(29,30)
30	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16)
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15)


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4) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
35	Zinc	4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16] 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]

ดิน จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
4	Anthracene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
8	Barium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]

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9 Benz(a)anthracene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
9	Benz(a)anthracene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
11	Benzo(b)fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
12	Benzo(k)fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
13	Benzoic acid	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
14	Benzo(a)pyrene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
15	Benzo(g,h,i)perylene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
17	Bis(2-chloroethyl)ether	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
18	Bis(2-ethylhexyl)phthalate	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
21	Butanol	Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^[12,24]
22	Butyl Benzyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
24	Carbazole	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]

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26 Carbon tetrachloride...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
28	p-Chloroaniline	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
32	2-Chlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8,15,17] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8,16,17]
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^[8,17]
36	Chrysene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
37	Cyanide	Extraction, Distillation, Colorimetric Method ^[26,27,28]
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
39	DDD	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]

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40 DDE...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
40	DDE	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
41	DDT	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
42	Dibenz(a,h)anthracene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
43	Di-n-Butyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
47	3,3-Dichlorobenzidine	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
53	2,4-Dichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]

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57 Dieldrin...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
58	Diethyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
59	2,4-Dimethylphenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
60	2,4-Dinitrophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
61	2,4-Dinitrotoluene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
62	2,6-Dinitrotoluene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
63	Di-n-Octyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
67	Fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
68	Fluorene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
70	Heptachlor Epoxide	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)

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71 Hexachlorobenzene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
73	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
74	α-HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
75	β-HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
76	γ-HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
77	Hexachlorocyclopentadiene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
78	Hexachloroethane	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
79	Indeno(1,2,3-cd)pyrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
80	Isophorone	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
81	Lead	1) Digestion, Inductively Coupled Plasma Method ^(7,15) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ^(7,15) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽¹⁸⁾

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และงานเก็บตัวอย่างเพื่อการ

2) Thermal...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry ^[19] 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^[20] Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^[12,24]
85	Methoxychlor	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
88	2-methylphenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
89	2-Methylnaphthalene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
91	Naphthalene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
93	Nitrobenzene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
94	N-Nitrosodiphenylamine	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
95	N-Nitrosodi-n-propylamine	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,23] 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^[23,32]

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- Aroclor 1242...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
	- 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 - 2,3,3',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',5,6-Nonachlorobiphenyl	
97	Pentachlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
98	Phenanthrene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
99	Phenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
100	Pyrene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]

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และทะเบียนห้องปฏิบัติการ

101 Selenium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
101	Selenium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
102	Silver	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
103	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
108	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
109	TPH (C ₉ -C ₁₆)	1) Solvent Extraction, Gas Chromatographic Method ^[11,21] 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^[21,31]
110	TPH (C ₁₆ -C ₃₅)	1) Solvent Extraction, Gas Chromatographic Method ^[11,21] 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^[21,31]
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
115	2,4,5-Trichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]

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116 2,4,6-Trichlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
116	2,4,6-Trichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
118	Vanadium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
119	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
121	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
122	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
123	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
125	Zinc	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]


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วิมล
(นางริกาญจน์ ฉัตรสกุลวิไล)
ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทางเคมี


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(นางริกาญจน์ จิตรสกุลวิไล)
ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
กรมโรงงานอุตสาหกรรม

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(นางริกาญจน์ จิตรสกุลวิไล)
ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
กระทรวงมหาดไทย

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ กองวิจัยและเคีอนำย้มมลพิษโรงงาน กรมโรงงานอุตสาหกรรม โทร. ๐ ๒๐๒๒ ๔๐๐๒, ๔๓๔๖

ที่ อก ๐๓๑๐(๑)/ ๕๓ ๗ ๕



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๐ ๙ มีนาคม ๒๕๖๖

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๔ กุมภาพันธ์ ๒๕๖๖

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ
เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๙ ราย

- | | |
|---------------------------------|--------------------------|
| ๑) นายนคร สุขเจริญ | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๒๒ |
| ๒) นายบัญชา นามเขตต์ | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๒๓ |
| ๓) นายอรรถพล นิยมวิทย์ | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๒๔ |
| ๔) นางสาวพัชรียา หงษ์สมดี | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๒๕ |
| ๕) นางสาวกานิดา สุรวงศ์ตระกูล | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๒๖ |
| ๖) นางสาวศรณีย์ ยิ่งดี | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๒๗ |
| ๗) นายสมโภช วันสา | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๒๘ |
| ๘) นายณัฐนันท์ ปานประเสริฐ | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๒๙ |
| ๙) ว่าที่ร้อยตรีภาณุพงศ์ แสนศรี | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๓๐ |
| ๑๐) นายมนันท์ พูลศิริ | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๓๑ |
| ๑๑) นายณัฐดนัย เจือละออง | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๓๒ |
| ๑๒) นางสาวกาญจนา คงคุณ | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๓๓ |
| ๑๓) นางสาวรัชนิกร นิยมกลาง | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๓๔ |
| ๑๔) นางสาวกัญญารัตน์ ศรีนิลทา | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๓๕ |
| ๑๕) นายศิริวัฒน์ พานิชย์ | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๓๖ |
| ๑๖) นางสาวกนกภรณ์ อุระ | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๓๗ |
| ๑๗) นางสาวจิตสุภา ประเทืองสุข | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๓๘ |
| ๑๘) นางสาวอริสา วิริยขันติธรรม | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๓๙ |
| ๑๙) นางสาวพนิดา ยอดอินทร์ | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๔๐ |

๒. ให้เพิ่มเจ้าหน้าที่...

-๒-

๒. ให้เพิ่มเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ ราย

- | | |
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| ๑) นายกาจบัณฑิต กิตติคุณชัย | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๐๐๑ |
| ๒) นายภัทรพล สว่างใจธรรม | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๐๐๒ |
| ๓) นายณราธิป เทือกชัยคำ | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๐๐๓ |
| ๔) นายศิริโชค พงษ์ประสม | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๐๐๔ |
| ๕) นายณัฐวุฒิ ดั่งวง | ทะเบียนเลขที่ ๖-๒๐๔-๖๑๐๐๕ |

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ที่ อก ๐๓๑๐(๑)/๑๐๖๔ ลงวันที่ ๒๘ มกราคม ๒๕๖๔ คือในวันที่ ๒ กันยายน ๒๕๖๖ ทั้งนี้ สามารถยื่นคำขอ
ผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม ตาม QR Code หายหนังสือฉบับนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

วิมล

(นางริกาญจน์ อัครสกุลวิไล)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๔๕

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



"อุตสาหกรรมก้าวหน้าไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ อก ๐๓๑๐(๓)/ ๖ ๑ ๒ ๕



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒ ๓ มีนาคม ๒๕๖๖

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๑๐ มีนาคม ๒๕๖๖

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด
ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐
ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากรของห้องปฏิบัติการ
วิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้เปลี่ยนแปลงชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการ
วิเคราะห์ จากเดิม นางสาวสรารักษ์ มงคลจิรภูมิ ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๗๑๙ เป็น นางสาวธัญญธร มงคลจิรภูมิ
ทะเบียนเลขที่ ๖-๒๐๔-จ-๔๗๑๙

ทั้งนี้ หากท่านมีความประสงค์จะยื่นคำขอใดๆ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์
ได้ทั้งหน้าเว็บไซต์กรมโรงงานอุตสาหกรรม ตาม QR Code ห้ายหนังสือฉบับนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายประสม คำพงษ์)
ผู้อำนวยการกองวิจัยและเฝ้าระวังมลพิษโรงงาน
ปฏิบัติการตามหนังสือที่กรมโรงงานอุตสาหกรรม

กองวิจัยและเฝ้าระวังมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๙๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



ยื่นคำขอผ่านระบบอิเล็กทรอนิกส์



อุตสาหกรรมสีเขียว ๖ ประการ โรงงานสีเขียว กว้างขวาง ปลอดภัย เชื่อถือได้

ที่ อก ๐๓๑๐(๓)/ ๖ ๔ ๗ ๐



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐
๒ ๔ มิถุนายน ๒๕๖๕

เรื่อง ขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๔ เมษายน ๒๕๖๔

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๒ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอขึ้นทะเบียน
ห้องปฏิบัติการวิเคราะห์เอกชน พร้อมรายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ เจ้าหน้าที่ประจำ
ห้องปฏิบัติการวิเคราะห์ และรายการสารมลพิษที่จะทำการวิเคราะห์ ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป
(ประเทศไทย) จำกัด ขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน มีเลขทะเบียน ๖-๓๒๓ สถานที่ตั้งเลขที่
๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่น้ำคู่ อำเภอปลวกแดง จังหวัดระยอง โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

๑) นายเดช ช้างชน

ทะเบียนเลขที่ ๖-๓๒๓-ก-๙๔๔๒

๒) นางวิลาวัลย์ บริรักษ์

ทะเบียนเลขที่ ๖-๓๒๓-ก-๙๔๔๓

๓) นายสุพจน์ สลามเต๊ะ

ทะเบียนเลขที่ ๖-๓๒๓-ก-๙๔๔๔

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

๑) นางสาวณัฐมล บรรจงกิจ

ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๔๕

๒) นางพจนา สีดา

ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๔๖

๓) นางสาวนิศา กุลสุริวงศ์

ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๔๗

๔) นายพิทยา ทองแดง

ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๔๘

๕) นางชลธิชา สุบงกช

ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๔๙

๖) ว่าที่ ร.ต.รณชัย ม่วงมา

ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๐

๗) นายวรารุณ พิบพา

ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๑

๘) นายศักดิ์รินทร์ จรัสกาย

ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๒

๙) นายสุรศักดิ์ สาชิน

ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๓

๑๐) นางสาวเพชรคุณ ภาณุตานนท์

ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๔

๑๑) นายสถาพร ถาแก้ว

ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๕

๑๒) นายสุทธิดำรงค์ โชคปิตินันท์

ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๖

๑๓) นายวัลลภ...

๑๓) นายวัลลภ หันไชยเนาว์
 ๑๔) นางสาวนาถิ์ เจริญตระกูล
 ๑๕) นางสาวนิดา ผดุงจิตต์
 ๑๖) นายธนะสิทธิ์ วงศ์ไชย
 ๑๗) นายชัยนุสรณ์ เลิศนันท์กุลชัย
 ๑๘) นายสัจจา เพ็ชรแสวง
 ๑๙) นายกันตภณ มณีสัมพันธ์
 ๒๐) นางสาวจันทิพย์ โกเมนชนะ
 ๒๑) นายธารินทร์ อ็อกจินดา
 ๒๒) นายศุภณัฐ พิสัยพันธ์
 ๒๓) นายศุภชัย วงศ์สุริยาชัย
 ๒๔) นายปฐมพงศ์ กรสวัสดิ์
 ๒๕) นายไสว ดันโพธิ์
 ๒๖) นางสาวกิตติยา สันญาริยาภรณ์
 ๒๗) นางสาวเจษฎาพร ศรีบุญเรือง
 ๒๘) นางสาวธรรินทร์ สิงห์เงา
 ๒๙) นางสาวธิดารัตน์ ศิริมงคลโร
 ๓๐) นายพิพัฒน์ นิภัทร์เศรษฐ์
 ๓๑) นายศิริวิทย์ เรืองลม
 ๓๒) นายปารามศ สัตยาคุณ
 ๓๓) นายนันท ธรรมสโร
 ๓๔) นางสาวศุภรัตน์ โสจันทร์
 ๓๕) นายพชรกร อินทรเสนา
 ๓๖) นายทิวากร เชื้อมาก
 ๓๗) นายอนุรักษ์ ทองขจรศักดิ์
 ๓๘) นายอภิชาติ วิลาศ
 ๓๙) นายจรัสระวี ศรีรักษา
 ๔๐) นายประสาธน์มิตร เชื้อนเพชร
 ๔๑) นายกานันต์ วังบง
 ๔๒) นายสันติ ชัยชนะ
 ๔๓) นายสิทธิชัย แก้วเกตุ
 ๔๔) นายทินกร กุลชาติ


ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๕๗
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๕๘
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๕๙
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๐๐
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๐๑
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๐๒
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๐๓
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๐๔
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๐๕
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๐๖
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๐๗
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๐๘
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๐๙
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๑๐
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๑๑
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 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๑๓
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๑๔
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๑๕
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๑๖
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๑๗
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๑๘
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๑๙
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๒๐
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 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๒๔
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๒๕
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 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๒๗
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๒๘
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๒๙
 ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๓๐

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๑๔ รายการ
 อากาศเสีย (ปล่องระบาย) จำนวน ๗ รายการ และน้ำใต้ดิน จำนวน ๓ รายการ รวมทั้งสิ้นจำนวน ๒๔ รายการ
 ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้มีอายุ ๓ ปี นับจากวันที่กรมโรงงานอุตสาหกรรมออกหนังสือ หากประสงค์
 จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบ
 คำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการ
 วิเคราะห์เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



(นางจินดา เทษะรินทร์)

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
 ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

๒๘ มิ.ย. ๒๕๖๕

กองวิจัยและเตือนภัยมลพิษโรงงาน
 ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
 โทร. ๐ ๓๘๐๙ ๗๒๖๑-๓
 ไปรษณีย์อิเล็กทรอนิกส์ einw@diw.mail.go.th

เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๓๒๓

ที่ อภ ๐๓๓๐(๓)/ ๖๔ ๗๐ ลงวันที่ ๒๘ มิถุนายน ๒๕๖๔

ขอขายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๔ รายการ

น้ำเสีย จำนวน 14 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Biochemical Oxygen Demand	1) 5-Day BOD Test, Membrane Electrode Method ^[2] 2) 5-Day BOD Test, Azide Modification Method ^[2]
2	Chemical Oxygen Demand	1) Open Reflux, Titrimetric Method ^[2] 2) Closed Reflux, Colorimetric Method ^[2] 3) Closed Reflux, Titrimetric Method ^[2]
3	Color	ADMI Weighted – Ordinate Spectrophotometric Method ^[2]
4	Cyanide	Distillation, Colorimetric Method ^[2]
5	Formaldehyde	Distillation, Colorimetric Method ^[1]
6	Free Chlorine	DPD-Ferrous Titrimetric Method ^[2]
7	Oil and Grease	Liquid-Liquid Partition-Gravimetric Method ^[2]
8	pH	Electrometric Method ^[2]
9	Phenols	1) Distillation, Chloroform Extraction Method ^[2] 2) Distillation, Direct Photometric Method ^[2]
10	Sulfide	ZnS Precipitation, Iodometric Method ^[2]
11	Temperature	Laboratory and Field Method ^[2]
12	Total Dissolved Solids	Dried at 180 °C ^[2]
13	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method ^[2]
14	Total Suspended Solids	Dried at 103-105 °C ^[2]

อากาศเสีย (ปล่องระบาย) จำนวน 7 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Carbon Monoxide	1) Sampling Bag, Non-Dispersive Infrared Method ^[5] 2) Instrumental Analyzer Method ^[8]
2	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[5]
3	Opacity	Ringelmann's Method ^[3,4]
4	Oxide of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ^[6] 2) Instrumental Analyzer Method ^[9]
5	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ^[5] 2) Instrumental Analyzer Method ^[10]

วิศกร สัมฤทธิ์
(นางสาววิชุดา สัมฤทธิ์ผล)

ผู้อำนวยการ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

Sulfuric Acid...

-2-

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Sulfuric Acid	Isokinetic Sampling, Barium – Thorin Titrimetric Method ^[6]
7	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[7]

น้ำใต้ดิน จำนวน 3 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method ^[2]
2	pH	Electrometric Method ^[2]
3	Phenols	Distillation, Direct Photometric Method ^[2]

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9. United States Environmental Protection Agency. Determination of Oxide of Nitrogen Emissions from Stationary Sources; Instrumental Analyzer Procedure. 40 CFR 60. Appendix A Method 7E, 2019.
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วิศกร สัมฤทธิ์
(นางสาววิชุดา สัมฤทธิ์ผล)

ผู้อำนวยการ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก กองวิจัยและเตือนภัยมลพิษโรงงาน กรมโรงงานอุตสาหกรรม โทร ๐ ๓๘๐๔ ๗๖๖๓-๓

สำเนา

ที่ อก ๐๓๒๐/ ๒๐๕๓

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒ มิ.ย. ๒๕๖๖

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอเปลี่ยนแปลงบุคลากร ของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๑๔ มีนาคม ๒๕๖๖

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๓๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่น้ำคู้ อำเภอปลวกแดง จังหวัดระยอง ขอเปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

ก. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ ราย

- | | | |
|------------------------------|---------------|---------------|
| ๑) นางสาวเจษฎาพร ศรีบุญเรือง | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๙๔๙๗๑ |
| ๒) นางสาววรุณิธร สิงห์เงา | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๙๔๙๗๒ |
| ๓) นางสาวนิตา ผดุงจิตต์ | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๙๔๕๕๔ |
| ๔) นายศุภณัฐ พิสัยพันธ์ | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๙๔๖๖๖ |
| ๕) นายสิทธิชัย แก้วเกตุ | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๙๔๘๘๗ |

ข. ให้เพิ่มเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๒ ราย

- | | | |
|------------------------------|---------------|--------------|
| ๑) นายณัฐพงษ์ เพ็งขานา | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๐๐๐๑ |
| ๒) นางสาวกัลยวรรณ รักดี | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๐๐๐๒ |
| ๓) นางสาวจุฑารัตน์ สีทองกลาง | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๐๐๐๓ |
| ๔) นางสาวจิตสุภา ประเทืองสุข | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๐๐๐๔ |
| ๕) นายสรเสริญ คุ้มยศ | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๐๐๐๕ |
| ๖) นายณัฐวุฒิ อภิมพมราช | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๐๐๐๖ |
| ๗) นายจิตรกร สีวะสา | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๐๐๐๗ |
| ๘) นายสิทธิพงษ์ สุวรรณรัตน์ | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๐๐๐๘ |
| ๙) นายสิทธิพันธ์ เสนาชีว | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๐๐๐๙ |
| ๑๐) นายอนุวัฒน์ เตมา | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๐๐๑๐ |
| ๑๑) นายสุรวิทย์ นราพงษ์ | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๐๐๑๑ |
| ๑๒) นายอดิศักดิ์ ตะริศบุญ | ทะเบียนเลขที่ | ๖-๓๒๓-จ-๐๐๑๒ |

-๒-

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ที่ อก ๐๓๓๐(๓)/๖๔๗๐ ลงวันที่ ๒๘ มิถุนายน ๒๕๖๔ คือในวันที่ ๒๘ มิถุนายน ๒๕๖๗ ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรมตาม QR Code ท้ายหนังสือนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



(นายทวี อำพาพันธ์)

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
โทร. ๐ ๓๓๑๓ ๖๐๕๔ ต่อ ๕๐๐๑-๒
ไปรษณีย์อิเล็กทรอนิกส์ einw@diw.mail.go.th



ยื่นคำขอผ่านระบบอิเล็กทรอนิกส์

อนึ่ง...



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน

วันที่ 4 เดือน สิงหาคม พ.ศ. 2566

ข้าพเจ้า () ผู้รับใบอนุญาตประกอบกิจการโรงงาน

(✓) บริษัท/ห้างหุ้นส่วนจำกัด เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

ตั้งอยู่ที่เลขที่ 104 หมู่ที่ 1 ตระกอก/ซอย พัฒนาการ 40

ถนน พัฒนาการ ตำบล/แขวง พัฒนาการ

อำเภอ/เขต สวนหลวง จังหวัด กรุงเทพมหานคร รหัสไปรษณีย์ 10250

โทรศัพท์ 02 760-3040 โทรสาร 0 2 760-3197

ได้รับทราบระเบียบกรมโรงงานอุตสาหกรรมว่าด้วยการขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน พ.ศ. 2560 โดยตลอดแล้วและยินยอม

ปฏิบัติตามระเบียบฯทุกประการ และได้แนบเอกสารต่างๆ ตามรายการเอกสารประกอบการพิจารณา (แบบ ปอ.1-1) มาพร้อมนี้

รายการขอขึ้นทะเบียน

การดำเนินการ	รายละเอียด (รายการ)				
	น้ำเสีย/น้ำทิ้ง	น้ำใต้ดิน	อากาศเสีย	สิ่งปฏิกูลหรือ วัสดุที่ไม่ใช้แล้ว	ดิน
[] ขอขึ้นทะเบียนห้องปฏิบัติการ วิเคราะห์เอกชน					
[✓] ต่ออายุห้องปฏิบัติการวิเคราะห์ เอกชน	59	126	16	35	125
[✓] เปลี่ยนแปลงสารมลพิษที่วิเคราะห์ (✓) เพิ่มสารมลพิษ () ยกเลิกสารมลพิษ			12		
[✓] เปลี่ยนแปลงบุคลากร (✓) เพิ่มบุคลากร (✓) ยกเลิกบุคลากร	จำนวน	38 ราย (รายละเอียดตาม แบบ ปว.1)			
	จำนวน	2 ราย (รายละเอียดตาม แบบ ปว.1)			
[] ยกเลิกห้องปฏิบัติการวิเคราะห์เอกชน					
[] อื่นๆ โปรดระบุ.....					

จึงเรียนมาเพื่อโปรดพิจารณา

ลงชื่อ.....
เพื่อโปรดพิจารณา

ลงชื่อ

(นางทัศนีย์ เลขาคุณพร)

ผู้มีอำนาจลงนามแทนนิติบุคคล

ประทับตรา (ถ้ามี)

ALS Laboratory Group
(Thailand) Co., Ltd.



(นายประพนธ์ คำรุ่งพงษ์)

ผู้อำนวยการกองวิจัยและพัฒนาคุณภาพโรงงาน



ที่ อก ๐๓๑๐(๓)/ ๖๔๗๐

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๔ มิถุนายน ๒๕๖๕

เรื่อง ขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๔ เมษายน ๒๕๖๔

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๒ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอขึ้นทะเบียน
ห้องปฏิบัติการวิเคราะห์เอกชน พร้อมรายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ เจ้าหน้าที่ประจำ
ห้องปฏิบัติการวิเคราะห์ และรายการสารมลพิษที่จะทำการวิเคราะห์ ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป
(ประเทศไทย) จำกัด ขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน มีเลขทะเบียน ๖-๓๒๓ สถานที่ตั้งเลขที่
๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่น้ำคู่ อำเภอปลวกแดง จังหวัดระยอง โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

๑) นายเดช ช้างชน ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๔๒

๒) นางวิลาวัลย์ บริรักษ์ ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๔๓

๓) นายสุพจน์ สลามเต๊ะ ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๔๔

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

๑) นางสาวณมล บรรจงกิจ ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๔๕

๒) นางพจนา สีดา ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๔๖

๓) นางสาวนิตา กุลสุริวงศ์ ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๔๗

๔) นายพิทยา ทองแดง ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๔๘

๕) นางชลธิชา สุบงกช ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๔๙

๖) ว่าที่ ร.ต.รณชัย ม่วงมา ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๐

๗) นายวรารุณ ฟ้าพา ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๑

๘) นายศักดิ์รินทร์ จรัสสาย ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๒

๙) นายสุรศักดิ์ สาขิน ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๓

๑๐) นางสาวเพชรคุณ ภาวตานนท์ ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๔

๑๑) นายสถาพร ถาแก้ว ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๕

๑๒) นายสุทธิดำรงค์ โชคปิตินันท์ ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๖

๑๓) นายวัลลภ หันไชยเนาว์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๕๗
๑๔) นางสาววนาลี เจริญตระกูล	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๕๘
๑๕) นางสาววนิดา ผดุงจิตต์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๕๙
๑๖) นายธนะสิทธิ์ วงศ์ไชย	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๐
๑๗) นายชัยนุสรณ์ เลิศนันทกุลชัย	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๑
๑๘) นายสัจจา เพ็ชรแสง	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๒
๑๙) นายกันตภณ มณีสัมพันธ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๓
๒๐) นางสาวจันทิพย์ โกเมนชนะ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๔
๒๑) นายธารินทร์ อ็อกจินดา	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๕
๒๒) นายศุภณัฐ พิสัยพันธ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๖
๒๓) นายศุภชัย วงศ์สุริยฉาย	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๗
๒๔) นายปฐมพงศ์ กรสวัสดิ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๘
๒๕) นายไสว ตันโพธิ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๙
๒๖) นางสาวกิตติยา สัญญาอาริยาภรณ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๐
๒๗) นางสาวเจษฎาพร ศรีบุญเรือง	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๑
๒๘) นางสาวมธุรินทร์ สิงห์เงา	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๒
๒๙) นางสาวธิดารัตน์ ศิริมงคลโร	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๓
๓๐) นายพิพัฒน์ นิกิตร์เศรษฐ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๔
๓๑) นายศิริวิทย์ เรืองสม	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๕
๓๒) นายปารเมศ สัตยาคุณ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๖
๓๓) นายณัฐนาท ธรรมสโร	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๗
๓๔) นางสาวศุภรัตน์ ไสจันทร์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๘
๓๕) นายพชรกร อินทรเสนา	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๙
๓๖) นายทิวากร เชื้อมาก	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๐
๓๗) นายอนุรักษ ทองขจรศักดิ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๑
๓๘) นายอภิชาติ วิลาศ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๒
๓๙) นายจรัสระวี ศรีรักษา	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๓
๔๐) นายประสานมิตร เชื้อนเพชร	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๔
๔๑) นายภาณุวัฒน์ วังบง	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๕
๔๒) นายสันติ ชัยชนะ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๖
๔๓) นายสิทธิชัย แก้วเกตุ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๗
๔๔) นายทินกร กุลชาติ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๘

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๑๔ รายการ
อากาศเสีย (ปล่องระบาย) จำนวน ๗ รายการ และน้ำใต้ดิน จำนวน ๓ รายการ รวมทั้งสิ้นจำนวน ๒๔ รายการ
ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้มีอายุ ๓ ปี นับจากวันที่กรมโรงงานอุตสาหกรรมออกหนังสือ หากประสงค์
จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบ
คำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการ
วิเคราะห์เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ


(นางจันทา เตชะธรรมา)

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติการตามแผนองค์การโรงงานอุตสาหกรรม

๒๘ มิ.ย. ๒๕๖๔

กองวิจัยและเตือนภัยมลพิษโรงงาน
ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
โทร. ๐ ๓๘๐๕ ๗๒๖๑-๓
ไปรษณีย์อิเล็กทรอนิกส์ eirw@diw.mail.go.th

เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุป (ประเทศไทย) จำกัด เลขทะเบียน ว-๓๒๓

ที่ อก ๐๓๑๐(๓)/ ๖๕ ๗๐

ลงวันที่ ๒๘ มิถุนายน ๒๕๖๕

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๔ รายการ

น้ำเสีย จำนวน 14 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Biochemical Oxygen Demand	1) 5-Day BOD Test, Membrane Electrode Method ^[2] 2) 5-Day BOD Test, Azide Modification Method ^[2]
2	Chemical Oxygen Demand	1) Open Reflux, Titrimetric Method ^[2] 2) Closed Reflux, Colorimetric Method ^[2] 3) Closed Reflux, Titrimetric Method ^[2]
3	Color	ADMI Weighted – Ordinate Spectrophotometric Method ^[2]
4	Cyanide	Distillation, Colorimetric Method ^[2]
5	Formaldehyde	Distillation, Colorimetric Method ^[1]
6	Free Chlorine	DPD-Ferrous Titrimetric Method ^[2]
7	Oil and Grease	Liquid-Liquid Partition-Gravimetric Method ^[2]
8	pH	Electrometric Method ^[2]
9	Phenols	1) Distillation, Chloroform Extraction Method ^[2] 2) Distillation, Direct Photometric Method ^[2]
10	Sulfide	ZnS Precipitation, Iodometric Method ^[2]
11	Temperature	Laboratory and Field Method ^[2]
12	Total Dissolved Solids	Dried at 180 °C ^[2]
13	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method ^[2]
14	Total Suspended Solids	Dried at 103-105 °C ^[2]

อากาศเสีย (ปล่องระบาย) จำนวน 7 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Carbon Monoxide	1) Sampling Bag, Non-Dispersive Infrared Method ^[5] 2) Instrumental Analyzer Method ^[6]
2	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[5]
3	Opacity	Ringelmann's Method ^[3,4]
4	Oxide of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ^[6] 2) Instrumental Analyzer Method ^[9]
5	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ^[5] 2) Instrumental Analyzer Method ^[10]

วิภา สัมฤทธิ์
(นางสาววิชุดา สัมฤทธิ์ผล)

ผู้อำนวยการ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

Sulfuric Acid...

-2-

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Sulfuric Acid	Isokinetic Sampling, Barium – Thorin Titrimetric Method ^[6]
7	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[7]

น้ำใต้ดิน จำนวน 3 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method ^[2]
2	pH	Electrometric Method ^[2]
3	Phenols	Distillation, Direct Photometric Method ^[2]

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วิภา สัมฤทธิ์
(นางสาววิชุดา สัมฤทธิ์ผล)

ผู้อำนวยการ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก กองวิจัยและเตือนภัยมลพิษโรงงาน กรมโรงงานอุตสาหกรรม โทร ๐ ๓๘๐๕ ๙๖๖๓-๓

สำเนา

ที่ อก ๐๓๒๐/ ๒๐๕๓

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๒ มี.ค. ๒๕๖๖

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอเปลี่ยนแปลงบุคลากร ของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๑๔ มีนาคม ๒๕๖๖

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๓๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่น้ำคู้ อำเภอปลวกแดง จังหวัดระยอง ขอเปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

ก. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ ราย

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|------------------------------|----------------------------|
| ๑) นางสาวเจษฎาพร ศรีบุญเรือง | ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๗๑ |
| ๒) นางสาวมธุรินทร์ สิงห์เงา | ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๗๒ |
| ๓) นางสาวนิตา ผดุงจิตต์ | ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๕๔ |
| ๔) นายศุภณัฐ ทิพย์พันธ์ | ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๖๖ |
| ๕) นายสิทธิชัย แก้วเกตุ | ทะเบียนเลขที่ ๖-๓๒๓-จ-๙๔๘๗ |

ข. ให้เพิ่มเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๒ ราย

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|------------------------------|----------------------------|
| ๑) นายณัฐพงษ์ เพ็งขานา | ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๑ |
| ๒) นางสาวกัลยพรรณ รักดี | ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๒ |
| ๓) นางสาวจุฑารัตน์ สีทองกลาง | ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๓ |
| ๔) นางสาวจิตสุภา ประเทืองสุข | ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๔ |
| ๕) นายสรเสริญ คุ้ยยกสุข | ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๕ |
| ๖) นายณัฐภูมิ อดมพรมราช | ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๖ |
| ๗) นายจิตรกร สีวะสา | ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๗ |
| ๘) นายสิทธิพงษ์ สุวรรณรัตน์ | ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๘ |
| ๙) นายสิทธิพันธ์ เสนาชีว | ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๙ |
| ๑๐) นายอนุเวศน์ เตมา | ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๑๐ |
| ๑๑) นายสุรวิทย์ นราพงษ์ | ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๑๑ |
| ๑๒) นายอดิศักดิ์ ตะริศุนย์ | ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๑๒ |

-๒-

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ที่ อก ๐๓๓๐(๓)/๖๔๗๐ ลงวันที่ ๒๘ มิถุนายน ๒๕๖๔ คือในวันที่ ๒๘ มิถุนายน ๒๕๖๗ ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรมตาม QR Code ท้ายหนังสือนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



(นายทวี อำพาพันธ์)

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
โทร. ๐ ๓๓๑๓ ๖๐๕๔ ต่อ ๕๐๐๑-๒
ไปรษณีย์อิเล็กทรอนิกส์ einw@diw.mail.go.th



ยื่นคำขอผ่านระบบอิเล็กทรอนิกส์

อนึ่ง...



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ อก ๐๓๒๐/๑๕๖๕๗



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๑๐ พ.ย. ๒๕๖๖

เรื่อง เปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๒๕ ตุลาคม ๒๕๖๖

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำนวน ๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๓๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่แก้ว อำเภอปลวกแดง จังหวัดระยอง ขอเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เพิ่มขอบข่ายสารมลพิษที่วิเคราะห์ในน้ำเสีย จำนวน ๑๓ รายการ และน้ำได้ดิน ๓ รายการ ตามสิ่งที่ส่งมาด้วย

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชนที่ อก ๐๓๒๐(๓)/๖๔๗๐ ลงวันที่ ๒๘ มิถุนายน ๒๕๖๔ คือในวันที่ ๒๘ มิถุนายน ๒๕๖๗ ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายทวี อำพาพันธ์)

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

โทร. ๐ ๓๓๑๓ ๖๐๕๕ ต่อ ๕๐๐๑-๒

ไปรษณีย์อิเล็กทรอนิกส์ einw@diw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๓๒๓

ที่ อก ๐๓๒๐/๑๕๖๕๗

ลงวันที่ ๑๐ พ.ย. ๒๕๖๖

ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๑๖ รายการ
น้ำเสีย จำนวน 13 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Biochemical Oxygen Demand	1) 5-Day BOD Test, Membrane Electrode Method
2	Chemical Oxygen Demand	2) 5-Day BOD Test, Azide Modification Method 1) Open Reflux, Titrimetric Method 2) Closed Reflux, Colorimetric Method 3) Closed Reflux, Titrimetric Method
3	Color	ADMI Weighted-Ordinate Spectrophotometric Method
4	Cyanide	Distillation, Colorimetric Method
5	Free Chlorine	DPD Ferrous Titrimetric Method
6	Oil and Grease	Liquid-Liquid, Partition-Gravimetric Method
7	pH	Electrometric Method
8	Phenols	1) Distillation, Chloroform Extraction Method 2) Distillation, Direct Photometric Method
9	Sulfide	ZnS Precipitation, Iodometric Method
10	Temperature	Field Method
11	Total Dissolved Solids	Dried at 180 °C
12	Total Kjeldahl Nitrogen	Semi-Macro Kjeldahl Method
13	Total Suspended Solids	Dried at 103-105 °C

น้ำได้ดิน จำนวน 3 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method
2	pH	Electrometric Method
3	Phenols	Distillation, Direct Photometric Method

เอกสารอ้างอิง

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

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