

ภาคผนวก ค

ใบรับรองผลการตรวจวิเคราะห์คุณภาพสิ่งแวดล้อม

ภาคผนวก ค-1

คุณภาพอากาศจากแหล่งกำเนิด



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 : 4513256049
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229820
Date Received :Oct 27, 2022
Date Reported :Oct 31, 2022
Report Number :2251859-2

Page 1 of 1

Sample Number 2229820-1
Sample Description Emission from Stationary Source
Location Reactor Feed Heater (AF-7) (GPS 47P 0733750, 1404290)
Measurement Date Oct 26, 2022

Stack Description

Ambient Temperature	31 °C	Diameter	1.50 m	Oxygen	5.28 %
Ambient Pressure	757 mmHg	Shape	Circle	Carbon dioxide	8.66 %
Type of Process	Combustion	Stack Temperature	198 °C	Gas Velocity	2.77 m/s
Type of Fuel	Natural Gas	Moisture	12.73 %	Flow Rate	9693 Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)		Carbon Monoxide (ppm)	
				at Actual O ₂	at 7% O ₂	at Actual O ₂	at 7% O ₂
1	01:30 PM - 01:50 PM	5.29	8.66	25.60	22.79	0.67	0.59
2	01:51 PM - 02:11 PM	5.27	8.65	25.60	22.77	0.79	0.71
3	02:12 PM - 02:32 PM	5.27	8.66	25.57	22.74	0.98	0.87
Average (ppm)		5.28	8.66	25.59	22.77	0.81	0.72
Guideline ^{1/} (ppm)				-	200	-	690
Guideline ^{2/} (ppm)				-	47	-	-
Result (mg/Nm ³)				48.14	42.83	0.93	0.83
Emission Rate at Actual O ₂ (g/s)				0.1296		0.0025	
Method				US EPA Method 7E		US EPA Method 10	

Sampled By : Sathaporn Thakarw


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
ทะเบียนเลขที่ ว-204-ค-6113

Approved by


Sarayuth Jittrantont
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-4702

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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 : 4513256049
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229820
Date Received : Oct 27, 2022
Date Reported : Oct 31, 2022
Report Number : 2251859-2

Page 1 of 1

Sample Number : 2229820-1
Sample Description : Emission from Stationary Source
Location : Reactor Feed Heater (AF-7) (GPS 47P 0733750, 1404290)
Measurement Date : Oct 26, 2022

		Stack Description			
Ambient Temperature	31 °C	Diameter	1.50 m	Oxygen	5.28 %
Ambient Pressure	757 mmHg	Shape	Circle	Carbon dioxide	8.66 %
Type of Process	Combustion	Stack Temperature	198 °C	Gas Velocity	2.77 m/s
Type of Fuel	Natural Gas	Moisture	12.73 %	Flow Rate	9693 Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)	
				at Actual O ₂	At 7% O ₂
1	01:30 PM - 01:50 PM	5.29	8.66	25.60	22.79
2	01:51 PM - 02:11 PM	5.27	8.65	25.60	22.77
3	02:12 PM - 02:32 PM	5.27	8.66	25.57	22.74
Average (ppm)		5.28	8.66	25.59	22.77
Guideline ^{1/} (ppm)				-	200
Guideline ^{2/} (ppm)				-	47
Result (mg/Nm ³)				48.14	42.83
Emission Rate at Actual O ₂ (g/s)				0.1296	
Guideline ^{2/} (g/s)				0.9900	
Method				US EPA Method 7E	

Sampled By : Sathaporn Thakarw
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
ทะเบียนเลขที่ ว-204-ค-6113

Approved by

Sarayuth Jittranont

Sarayuth Jittranont
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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229829

Date Received : Oct 27, 2022

Date Reported : Nov 03, 2022

Report Number: 2251898-1

Page 1 of 2

Sample Number	2229829-1
Sampled Date	Oct 26, 2022
Sample Description	Emission from Stationary Source
Location	Reactor Feed Heater (AF-7) (GPS 47P 0733750, 1404290)
Date Analysis Commenced	Oct 28, 2022
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	757	mmHg	Diameter	1.50	m	Oxygen	5.3	%
Ambient Temperature	31.0	°C	Shape	Circle		Carbon Dioxide	8.7	%
Type of Process	Combustion		Stack Temperature	198	°C	Gas Velocity	2.8	m/s
Type of Fuel	Natural Gas		Moisture	12.69	%	Flow Rate (Actual O2)	9686	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 %O ₂	Result at 5.3 % O ₂	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing										
Total Suspended Particulate	01:30 PM - 02:24 PM	mg/m3	-	0.5	<0.5	<0.5	320	50	US 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)

ทะเบียนเลขที่ ว-323-จ-9447

Approved by

D. Chumon.

Dej Changchon

Senior Manager

ทะเบียนเลขที่ ว-323-ก-9442

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S:\Reports\Air Stack_O2_2GL.rpt (3:12PM)



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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229829

Date Received : Oct 27, 2022

Date Reported : Nov 03, 2022

Report Number: 2251898-1

Page 2 of 2

Sample Number	2229829-1
Sampled Date	Oct 26, 2022
Sample Description	Emission from Stationary Source
Location	Reactor Feed Heater (AF-7) (GPS 47P 0733750, 1404290)
Date Analysis Commenced	Oct 28, 2022
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	757	mmHg	Diameter	1.50	m	Oxygen	5.3	%
Ambient Temperature	31.0	°C	Shape	Circle		Carbon Dioxide	8.7	%
Type of Process	Combustion		Stack Temperature	198	°C	Gas Velocity	2.8	m/s
Type of Fuel	Natural Gas		Moisture	12.69	%	Flow Rate (Actual O2)	9686	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	01:30 PM - 02:24 PM	g/s	-	-	<0.001	-	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 : Sathaporn Thakarnw

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)
ทะเบียนเลขที่ ๖-323-๖-9447

Approved by

D. Chumon.

Dej Changchon
Senior Manager
ทะเบียนเลขที่ 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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229829

Date Received : Oct 27, 2022

Date Reported : Nov 03, 2022

Report Number: 2251898-2

Page 1 of 1

Sample Number	2229829-1
Sampled Date	Oct 26, 2022
Sample Description	Emission from Stationary Source
Location	Reactor Feed Heater (AF-7) (GPS 47P 0733750, 1404290)
Date Analysis Commenced	Oct 28, 2022
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	757	mmHg	Diameter	1.50	m	Oxygen	5.3	%
Ambient Temperature	31.0	°C	Shape	Circle		Carbon Dioxide	8.7	%
Type of Process	Combustion		Stack Temperature	198	°C	Gas Velocity	2.8	m/s
Type of Fuel	Natural Gas		Moisture	12.69	%	Flow Rate (Actual O2)	9686	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 % O ₂	Result at 5.3 % O ₂	Method	Testing Location
Air Testing								
Methane as Propane	01:40 PM - 01:50 PM	ppm	-	0.4	<0.4	<0.4	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	Rayong
Non-Methane Hydrocarbon as Propane	01:40 PM - 01:50 PM	ppm	-	0.4	2.4	2.7	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	Rayong
Total Hydrocarbon as Propane	01:40 PM - 01:50 PM	ppm	-	0.4	2.4	2.7	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	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 : Sathapron Thakarw

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 : 4513256049
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229824
Date Received : Oct 27, 2022
Date Reported : Oct 31, 2022
Report Number : 2251866-2

Page 1 of 1

Sample Number : 2229824-1
Sample Description : Emission from Stationary Source
Location : Fired Heater (AF-9) (GPS 47P 0733750, 1404298)
Measurement Date : Oct 26, 2022

Stack Description

Ambient Temperature	31 °C	Diameter	1.60 m	Oxygen	4.23 %
Ambient Pressure	757 mmHg	Shape	Circle	Carbon dioxide	9.89 %
Type of Process	Combustion	Stack Temperature	217 °C	Gas Velocity	5.63 m/s
Type of Fuel	Natural Gas	Moisture	12.35 %	Flow Rate	21656 Nm ³ /hr


Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)		Carbon Monoxide (ppm)	
				at Actual O ₂	at 7% O ₂	at Actual O ₂	at 7% O ₂
1	01:15 PM - 01:35 PM	4.17	9.91	23.34	19.40	0.14	0.12
2	01:36 PM - 01:56 PM	4.19	9.92	23.15	19.25	0.08	0.07
3	01:57 PM - 02:17 PM	4.34	9.83	23.14	19.42	0.17	0.14
Average (ppm)		4.23	9.89	23.21	19.36	0.13	0.11
Guideline ^{1/} (ppm)				-	200	-	690
Guideline ^{2/} (ppm)				-	47	-	-
Result (mg/Nm ³)				43.66	36.42	0.15	0.12
Emission Rate at Actual O ₂ (g/s)				0.2627		0.0009	
Method				US EPA Method 7E		US EPA Method 10	

Sampled By : Saksit Phaisanphisut

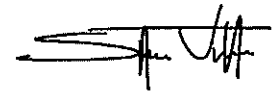
Guideline : ^{1/}Notification of the Ministry of Industry 2006 (B.E. 2549) Published in the Royal Government Gazette, Vol.123 Special Part 125 D, dated December 4, 2006 (B.E. 2549)

^{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
ทะเบียนเลขที่ ว-204-ค-6113

Approved by


Sarayuth Jittrantont
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-4702

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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 : 4513256049
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229824
Date Received : Oct 27, 2022
Date Reported : Oct 31, 2022
Report Number : 2251866-2

Page 1 of 1

Sample Number : 2229824-1
Sample Description : Emission from Stationary Source
Location : Fired Heater (AF-9) (GPS 47P 0733750, 1404298)
Measurement Date : Oct 26, 2022

Stack Description							
Ambient Temperature	31	°C	Diameter	1.60	m	Oxygen	4.23 %
Ambient Pressure	757	mmHg	Shape	Circle		Carbon dioxide	9.89 %
Type of Process	Combustion		Stack Temperature	217	°C	Gas Velocity	5.63 m/s
Type of Fuel	Natural Gas		Moisture	12.35	%	Flow Rate	21656 Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)	
				at Actual O ₂	At 7% O ₂
1	01:15 PM - 01:35 PM	4.17	9.91	23.34	19.40
2	01:36 PM - 01:56 PM	4.19	9.92	23.15	19.25
3	01:57 PM - 02:17 PM	4.34	9.83	23.14	19.42
Average (ppm)		4.23	9.89	23.21	19.36
Guideline ^{1/} (ppm)				-	200
Guideline ^{2/} (ppm)				-	47
Result (mg/Nm ³)				43.66	36.42
Emission Rate at Actual O ₂ (g/s)				0.2627	
Guideline ^{2/} (g/s)				1.1400	
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
ทะเบียนเลขที่ ว-204-ค-6113

Approved by

Sarayuth Jitranont
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-4702

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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 : 4513256049
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229831
Date Received : Oct 27, 2022
Date Reported : Nov 03, 2022
Report Number: 2251905-1

Page 1 of 2

Sample Number 2229831-1
Sampled Date Oct 26, 2022
Sample Description Emission from Stationary Source
Location Fired Heater (AF-9)
Date Analysis Commenced Oct 28, 2022
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	757	mmHg	Diameter	1.60	m	Oxygen	4.2	%
Ambient Temperature	31.0	°C	Shape	Circle		Carbon Dioxide	9.9	%
Type of Process	Combustion		Stack Temperature	217	°C	Gas Velocity	5.6	m/s
Type of Fuel	Natural Gas		Moisture	12.42	%	Flow Rate (Actual O2)	21618	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 %O ₂	Result at 4.2 % O ₂	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing										
Total Suspended Particulate	01:20 PM - 02:08 PM	mg/m3	-	0.5	<0.5	<0.5	320	50	US 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)

ทะเบียนเลขที่ ว-323-จ-9447

Approved by

D. Changchon

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-ค-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 : 4513256049
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229831
Date Received : Oct 27, 2022
Date Reported : Nov 03, 2022
Report Number: 2251905-1

Page 2 of 2

Sample Number 2229831-1
Sampled Date Oct 26, 2022
Sample Description Emission from Stationary Source
Location Fired Heater (AF-9)
Date Analysis Commenced Oct 28, 2022
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	757	mmHg	Diameter	1.60	m	Oxygen	4.2	%
Ambient Temperature	31.0	°C	Shape	Circle		Carbon Dioxide	9.9	%
Type of Process	Combustion		Stack Temperature	217	°C	Gas Velocity	5.6	m/s
Type of Fuel	Natural Gas		Moisture	12.42	%	Flow Rate (Actual O2)	21618	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	01:20 PM - 02:08 PM	g/s	-	-	<0.003	-	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 : Tarin Octjinda

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)

ทะเบียนเลขที่ ๖-323-๖-9447

Approved by

D. Chumon.

Dej Changchon

Senior Manager

ทะเบียนเลขที่ ๖-323-ค-9442

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6506-83/ EMAIL

S:\Reports\Air Stack_O2_2GL.rpt (3:19PM)



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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229831

Date Received : Oct 27, 2022

Date Reported : Nov 03, 2022

Report Number: 2251905-2

Page 1 of 1

Sample Number	2229831-1
Sampled Date	Oct 26, 2022
Sample Description	Emission from Stationary Source
Location	Fired Heater (AF-9)
Date Analysis Commenced	Oct 28, 2022
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	757	mmHg	Diameter	1.60	m	Oxygen	4.2	%
Ambient Temperature	31.0	°C	Shape	Circle		Carbon Dioxide	9.9	%
Type of Process	Combustion		Stack Temperature	217	°C	Gas Velocity	5.6	m/s
Type of Fuel	Natural Gas		Moisture	12.42	%	Flow Rate (Actual O2)	21618	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 % O ₂	Result at 4.2 % O ₂	Method	Testing Location
Air Testing								
Methane as Propane	01:40 PM - 01:50 PM	ppm	-	0.4	<0.4	<0.4	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	Rayong
Non-Methane Hydrocarbon as Propane	01:40 PM - 01:50 PM	ppm	-	0.4	<0.4	<0.4	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	Rayong
Total Hydrocarbon as Propane	01:40 PM - 01:50 PM	ppm	-	0.4	<0.4	<0.4	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	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 : Tarin Octjinda

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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229825

Date Received : Oct 27, 2022

Date Reported : Oct 31, 2022

Report Number : 2251872-2

Page 1 of 1

Sample Number 2229825-1
Sample Description Emission from Stationary Source
Location Styrene Furnace (GPS 47P 0733853, 1404279)
Measurement Date Oct 27, 2022

Stack Description

Ambient Temperature	31 °C	Diameter	2.75 m	Oxygen	9.07 %
Ambient Pressure	757 mmHg	Shape	Circle	Carbon dioxide	3.99 %
Type of Process	Combustion	Stack Temperature	182 °C	Gas Velocity	4.76 m/s
Type of Fuel	Natural Gas	Moisture	12.71 %	Flow Rate	57968 Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)		Carbon Monoxide (ppm)	
				at Actual O ₂	at 7% O ₂	at Actual O ₂	at 7% O ₂
1	11:40 AM - 12:00 PM	9.06	3.99	67.93	79.75	2.24	2.63
2	12:01 PM - 12:21 PM	9.07	4.00	67.78	79.62	2.44	2.87
3	12:22 PM - 12:42 PM	9.07	3.98	67.71	79.59	2.53	2.97
Average (ppm)		9.07	3.99	67.81	79.65	2.40	2.82
Guideline ^{1/} (ppm)				-	200	-	690
Guideline ^{2/} (ppm)				-	200	-	-
Result (mg/Nm ³)				127.58	149.86	2.75	3.23
Emission Rate at Actual O ₂ (g/s)				2.0543		0.0443	
Method				US EPA Method 7E		US EPA Method 10	

Sampled By : Sathaporn Thakaw

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

ทะเบียนเลขที่ ว-204-ค-6113

Approved by

Sarayuth Jitranont
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-4702

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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 : 4513256049
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229825
Date Received : Oct 27, 2022
Date Reported : Oct 31, 2022
Report Number : 2251872-2

Page 1 of 1

Sample Number : 2229825-1
Sample Description : Emission from Stationary Source
Location : Styrene Furnace (GPS 47P 0733853, 1404279)
Measurement Date : Oct 27, 2022

Stack Description

Ambient Temperature	31 °C	Diameter	2.75 m	Oxygen	9.07 %
Ambient Pressure	757 mmHg	Shape	Circle	Carbon dioxide	3.99 %
Type of Process	Combustion	Stack Temperature	182 °C	Gas Velocity	4.76 m/s
Type of Fuel	Natural Gas	Moisture	12.71 %	Flow Rate	57968 Nm ³ /hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)	
				at Actual O ₂	At 7% O ₂
1	11:40 AM - 12:00 PM	9.06	3.99	67.93	79.75
2	12:01 PM - 12:21 PM	9.07	4.00	67.78	79.62
3	12:22 PM - 12:42 PM	9.07	3.98	67.71	79.59
Average (ppm)		9.07	3.99	67.81	79.65
Guideline ^{1/} (ppm)				-	200
Guideline ^{2/} (ppm)				-	200
Result (mg/Nm ³)				127.58	149.86
Emission Rate at Actual O ₂ (g/s)				2.0543	
Guideline ^{2/} (g/s)				8.2300	
Method				US EPA Method 7E	

Sampled By : Sathaporn Thakarn

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
ทะเบียนเลขที่ ว-204-ค-6113

Approved by

Sarayuth Jittranont

Sarayuth Jittranont
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-4702

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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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229832

Date Received : Oct 27, 2022

Date Reported : Nov 03, 2022

Report Number: 2251909-1

Page 1 of 2

Sample Number 2229832-1
Sampled Date Oct 27, 2022
Sample Description Emission from Stationary Source
Location Styrene Furnace (GPS 47P 0733853, 1404279)
Date Analysis Commenced Oct 28, 2022
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	757	mmHg	Diameter	2.75	m	Oxygen	9.1	%
Ambient Temperature	31.0	°C	Shape	Circle		Carbon Dioxide	4.0	%
Type of Process	Combustion		Stack Temperature	182	°C	Gas Velocity	4.8	m/s
Type of Fuel	Natural Gas		Moisture	12.66	%	Flow Rate (Actual O2)	57971	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 %O ₂	Result at 9.1 % O ₂	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing										
Total Suspended Particulate	11:40 AM - 12:28 PM	mg/m3	-	0.5	<0.5	<0.5	320	60	US 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)

ทะเบียนเลขที่ ๖-323-๖-9447

Approved by

D. Chamon.

Dej Changchon

Senior Manager

ทะเบียนเลขที่ ๖-323-๖-9442

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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 : 4513256049
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229832
Date Received : Oct 27, 2022
Date Reported : Nov 03, 2022
Report Number: 2251909-1

Page 2 of 2

Sample Number 2229832-1
Sampled Date Oct 27, 2022
Sample Description Emission from Stationary Source
Location Styrene Furnace (GPS 47P 0733853, 1404279)
Date Analysis Commenced Oct 28, 2022
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	757	mmHg	Diameter	2.75	m	Oxygen	9.1	%
Ambient Temperature	31.0	°C	Shape	Circle		Carbon Dioxide	4.0	%
Type of Process	Combustion		Stack Temperature	182	°C	Gas Velocity	4.8	m/s
Type of Fuel	Natural Gas		Moisture	12.66	%	Flow Rate (Actual O2)	57971	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	11:40 AM - 12:28 PM	g/s	-	-	<0.008	-	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 : Jaradrawee Sriruksa

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)
ทะเบียนเลขที่ ๖-323-๖-9447

Approved by

D. Chamon.

Dej Changchon
Senior Manager
ทะเบียนเลขที่ ๖-323-ค-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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2229832

Date Received : Oct 27, 2022

Date Reported : Nov 03, 2022

Report Number: 2251909-2

Page 1 of 1

Sample Number 2229832-1
Sampled Date Oct 27, 2022
Sample Description Emission from Stationary Source
Location Styrene Furnace (GPS 47P 0733853, 1404279)
Date Analysis Commenced Oct 28, 2022
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	757	mmHg	Diameter	2.75	m	Oxygen	9.1	%
Ambient Temperature	31.0	°C	Shape	Circle		Carbon Dioxide	4.0	%
Type of Process	Combustion		Stack Temperature	182	°C	Gas Velocity	4.8	m/s
Type of Fuel	Natural Gas		Moisture	12.66	%	Flow Rate (Actual O2)	57971	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result		Method	Testing Location
					at 7 % O ₂	at 9.1 % O ₂		
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	1.1	0.9	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	Rayong
Total Hydrocarbon as Propane	12:00 PM - 12:10 PM	ppm	-	0.4	1.1	0.9	Total Hydrocarbon Analyzer, Based on US EPA Method 25A	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 : Jaradrawee Sriruksa

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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ภาคผนวก ค-2

คุณภาพอากาศในบรรยากาศ



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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 22119541

Date Received : Nov 01, 2022

Date Reported : Nov 07, 2022

Report Number: 2447528-1

Page 1 of 1

Sample Description	Air Quality				
Location	บ้านอ่าวประจักษ์ (โรงพยาบาลส่งเสริมสุขภาพตำบลตากวน) (GPS 47P 0735531, 1402769)				
Date Analysis Commenced	Nov 02, 2022				
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)
22119541-1	Oct 25 - Oct 26, 2022	0.119	0.065	756	32
22119541-2	Oct 26 - Oct 27, 2022	0.053	0.037	756	32
22119541-3	Oct 27 - Oct 28, 2022	0.049	0.026	756	32
22119541-4	Oct 28 - Oct 29, 2022	0.038	0.027	756	32
22119541-5	Oct 29 - Oct 30, 2022	0.064	0.030	756	32
22119541-6	Oct 30 - Oct 31, 2022	0.085	0.023	756	31
22119541-7	Oct 31 - Nov 01, 2022	0.084	0.049	756	31
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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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 : 4513256049
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 22119527
Date Received : Nov 01, 2022
Date Reported : Nov 05, 2022
Report Number: 2447501-1

Page 1 of 1

Sample Description	Air Quality						
Location	บ้านฉางประตู (โรงพยาบาลส่งเสริมสุขภาพตำบลฉาง) (GPS 47P 0735531, 1402769)						
Parameter	Nitrogen dioxide (ppm)						
Measurement Date	Oct 25, 2022 - Nov 01, 2022						
Measurement by	Sitpawit Suwannarat						
Time	22119527-1 Oct 25, 2022	22119527-2 Oct 26, 2022	22119527-3 Oct 27, 2022	22119527-4 Oct 28, 2022	22119527-5 Oct 29, 2022	22119527-6 Oct 30, 2022	22119527-7 Oct 31, 2022
10:00 AM - 11:00 AM	<0.001	<0.001	0.002	<0.001	<0.001	0.001	<0.001
11:00 AM - 12:00 PM	0.002	<0.001	0.001	0.001	<0.001	0.001	<0.001
12:00 PM - 01:00 PM	0.001	0.002	<0.001	0.001	0.001	0.001	<0.001
01:00 PM - 02:00 PM	<0.001	<0.001	0.002	0.001	0.002	<0.001	<0.001
02:00 PM - 03:00 PM	0.001	<0.001	0.002	<0.001	0.002	<0.001	<0.001
03:00 PM - 04:00 PM	0.001	<0.001	0.004	0.003	0.001	0.001	<0.001
04:00 PM - 05:00 PM	0.003	0.002	0.004	0.010	0.001	<0.001	0.001
05:00 PM - 06:00 PM	0.003	0.011	0.002	0.029	0.001	0.001	0.004
06:00 PM - 07:00 PM	0.002	0.023	0.002	0.039	0.001	0.002	0.004
07:00 PM - 08:00 PM	0.003	0.023	0.003	0.040	0.002	0.002	0.021
08:00 PM - 09:00 PM	0.003	0.007	0.004	0.020	0.001	0.003	0.009
09:00 PM - 10:00 PM	0.003	0.003	0.003	0.007	<0.001	0.002	0.007
10:00 PM - 11:00 PM	0.003	0.003	0.006	0.003	0.001	0.002	0.003
11:00 PM - 12:00 AM	0.002	0.002	0.009	0.002	<0.001	0.002	0.002
12:00 AM - 01:00 AM	0.003	0.002	0.008	0.001	<0.001	0.002	0.002
01:00 AM - 02:00 AM	0.002	0.002	0.004	0.002	<0.001	0.001	0.002
02:00 AM - 03:00 AM	0.002	0.001	0.003	0.001	<0.001	<0.001	0.002
03:00 AM - 04:00 AM	0.002	0.001	0.002	0.001	<0.001	<0.001	0.002
04:00 AM - 05:00 AM	0.002	0.002	0.003	0.001	<0.001	0.001	0.002
05:00 AM - 06:00 AM	0.004	0.006	0.005	0.002	0.001	0.002	0.002
06:00 AM - 07:00 AM	0.003	0.005	0.004	0.002	0.001	0.002	0.002
07:00 AM - 08:00 AM	0.002	0.003	0.002	0.001	<0.001	<0.001	0.001
08:00 AM - 09:00 AM	0.001	0.003	0.002	<0.001	<0.001	<0.001	0.002
09:00 AM - 10:00 AM	0.001	0.002	0.001	<0.001	<0.001	<0.001	0.002
Average	0.002	0.004	0.003	0.007	0.001	0.001	0.003
1hr - Maximum	0.004	0.023	0.009	0.040	0.002	0.003	0.021
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)

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Approved by

Saranya C.

Saranya Chalemthamrong
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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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID : 22119534

Date Received : Nov 01, 2022

Date Reported : Nov 09, 2022

Report Number : 2447511-1

Page 1 of 2

Sample Number : 22119534-1 to 7
Parameter : Wind Speed / Wind Direction
Location : บ้านอ่าวประดู่ (โรงพยาบาลส่งเสริมสุขภาพตำบลตากวน) (GPS 47P 0735531, 1402769)
Sampling Date : Oct 25 - Nov 01, 2022
Sampling by : Sitpawit Suwannarat

Time	Oct 25 - Oct 26, 2022			Oct 26 - Oct 27, 2022			Oct 27 - Oct 28, 2022			Oct 28 - Oct 29, 2022			Oct 29 - Oct 30, 2022			Oct 30 - Oct 31, 2022			Oct 31 - Nov 01, 2022		
	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	1.1	190.0	S	0.8	34.0	NE	2.7	72.0	ENE	2.0	46.0	NE	0.7	35.0	NE	0.7	182.0	S	3.3	59.0	ENE
11:00 AM - 12:00 PM	2.1	247.0	WSW	0.0	-	-	1.6	66.0	ENE	0.3	23.0	NNE	1.1	186.0	S	1.2	194.0	SSW	0.9	344.0	NNW
12:00 PM - 01:00 PM	1.6	187.0	S	0.5	236.0	SW	0.7	143.0	SE	1.1	49.0	NE	0.4	139.0	SE	0.9	189.0	S	1.2	2.0	N
01:00 PM - 02:00 PM	2.8	250.0	WSW	2.4	212.0	SSW	0.0	-	-	0.7	69.0	ENE	1.8	248.0	WSW	1.8	252.0	WSW	1.0	62.0	ENE
02:00 PM - 03:00 PM	0.8	278.0	W	0.4	226.0	SW	0.0	-	-	1.1	183.0	S	1.2	253.0	WSW	0.4	220.0	SW	2.5	11.0	N
03:00 PM - 04:00 PM	0.3	280.0	W	2.6	86.0	E	0.3	224.0	SW	0.8	101.0	E	0.0	-	-	0.6	210.0	SSW	0.0	-	-
04:00 PM - 05:00 PM	0.3	39.0	NE	0.4	292.0	WNW	0.3	161.0	SSE	0.4	98.0	E	0.9	28.0	NNE	0.3	212.0	SSW	0.3	75.0	ENE
05:00 PM - 06:00 PM	0.4	40.0	NE	0.0	-	-	0.6	63.0	ENE	0.3	99.0	E	0.7	29.0	NNE	0.5	210.0	SSW	1.5	73.0	ENE
06:00 PM - 07:00 PM	0.0	-	-	0.0	-	-	0.5	63.0	ENE	0.3	101.0	E	0.5	16.0	NNE	1.2	210.0	SSW	0.6	75.0	ENE
07:00 PM - 08:00 PM	0.3	39.0	NE	0.0	-	-	1.1	38.0	NE	0.0	-	-	0.3	13.0	NNE	0.3	210.0	SSW	0.7	73.0	ENE
08:00 PM - 09:00 PM	0.3	2.0	N	0.5	39.0	NE	0.3	37.0	NE	0.7	46.0	NE	0.2	-	-	0.3	210.0	SSW	0.3	73.0	ENE
09:00 PM - 10:00 PM	0.3	28.0	NNE	0.0	-	-	0.3	38.0	NE	0.0	-	-	0.0	-	-	1.3	208.0	SSW	0.3	73.0	ENE
10:00 PM - 11:00 PM	0.5	49.0	NE	0.5	21.0	NNE	0.9	37.0	NE	0.5	35.0	NE	0.4	33.0	NNE	0.6	210.0	SSW	0.6	45.0	NE
11:00 PM - 12:00 AM	0.3	45.0	NE	0.5	100.0	E	1.3	38.0	NE	0.8	35.0	NE	0.2	-	-	0.5	210.0	SSW	0.4	32.0	NNE
12:00 AM - 01:00 AM	0.6	42.0	NE	1.1	37.0	NE	0.4	38.0	NE	1.5	18.0	NNE	0.0	-	-	0.0	-	-	0.3	34.0	NE
01:00 AM - 02:00 AM	1.0	18.0	NNE	0.0	-	-	0.3	38.0	NE	0.1	-	-	0.8	36.0	NE	0.4	1.0	N	0.3	36.0	NE
02:00 AM - 03:00 AM	0.4	11.0	N	0.0	-	-	0.0	-	-	0.8	27.0	NNE	0.5	36.0	NE	0.5	30.0	NNE	0.0	-	-
03:00 AM - 04:00 AM	0.8	30.0	NNE	0.1	-	-	0.0	-	-	1.6	71.0	ENE	0.7	43.0	NE	0.3	36.0	NE	0.6	40.0	NE
04:00 AM - 05:00 AM	0.3	20.0	NNE	0.0	-	-	1.1	24.0	NNE	0.4	29.0	NNE	0.6	16.0	NNE	0.8	15.0	NNE	0.3	21.0	NNE
05:00 AM - 06:00 AM	2.2	26.0	NNE	1.6	38.0	NE	3.6	27.0	NNE	0.2	-	-	0.7	11.0	N	0.6	30.0	NNE	1.1	27.0	NNE
06:00 AM - 07:00 AM	0.5	105.0	ESE	1.0	93.0	E	1.1	47.0	NE	0.9	79.0	E	1.4	93.0	E	0.9	68.0	ENE	0.8	34.0	NE
07:00 AM - 08:00 AM	0.4	50.0	NE	0.3	53.0	NE	0.5	39.0	NE	0.3	4.0	N	1.9	45.0	NE	1.4	359.0	N	0.4	36.0	NE
08:00 AM - 09:00 AM	1.3	43.0	NE	0.6	26.0	NNE	0.9	46.0	NE	2.1	42.0	NE	1.9	52.0	NE	2.3	23.0	NNE	0.3	37.0	NE
09:00 AM - 10:00 AM	0.0	-	-	0.7	29.0	NNE	2.6	11.0	N	0.5	74.0	ENE	1.9	226.0	SW	2.6	40.0	NE	0.6	40.0	NE

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Approved by

Sarayuth Jittrantont
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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID : 22119534

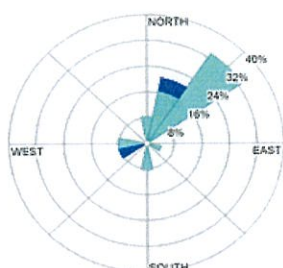
Date Received : Nov 01, 2022

Date Reported : Nov 09, 2022

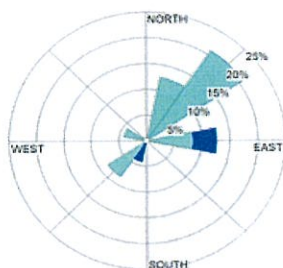
Report Number : 2447511-1

Page 2 of 2

Wind Rose



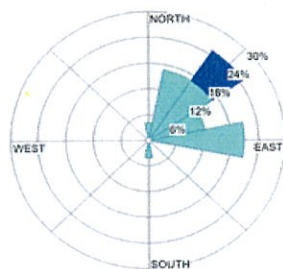
Date : Oct 25-26, 2022



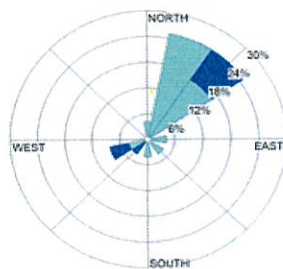
Date : Oct 26-27, 2022



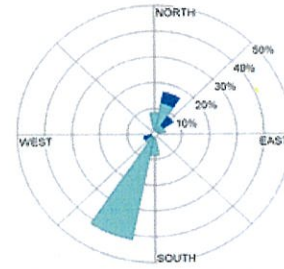
Date : Oct 27-28, 2022



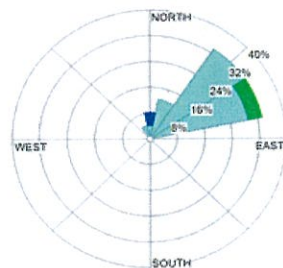
Date : Oct 28-29, 2022



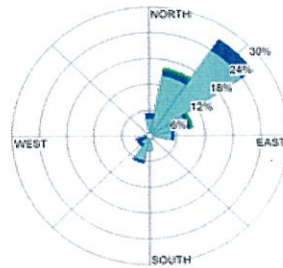
Date : Oct 29-30, 2022



Date : Oct 30-31, 2022



Date : Oct 31-Nov 01, 2022



Date : Oct 25-Nov 01, 2022

WS(m/s)	%
≥ 10.0	0.00
8.0-10.0	0.00
5.5-8.0	0.00
3.3-5.5	1.19
1.7-3.3	10.12
0.3-1.7	72.62
Calms	16.07

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Approved by

Sarayuth Jitranont
Assistant General Manager



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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 22119545

Date Received : Nov 01, 2022

Date Reported : Nov 07, 2022

Report Number: 2447541-1

Page 1 of 1

Sample Description	Air Quality				
Location	บ้านนาหว้า (GPS 47P 0735346, 1406705)				
Date Analysis Commenced	Nov 02, 2022				
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)
22119545-1	Oct 25 - Oct 26, 2022	0.087	0.048	756	32
22119545-2	Oct 26 - Oct 27, 2022	0.052	0.029	756	32
22119545-3	Oct 27 - Oct 28, 2022	0.036	0.019	756	32
22119545-4	Oct 28 - Oct 29, 2022	0.046	0.027	756	32
22119545-5	Oct 29 - Oct 30, 2022	0.052	0.033	756	32
22119545-6	Oct 30 - Oct 31, 2022	0.084	0.049	756	31
22119545-7	Oct 31 - Nov 01, 2022	0.091	0.054	756	31
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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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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 22119512

Date Received : Nov 01, 2022

Date Reported : Nov 05, 2022

Report Number: 2447505-1

Page 1 of 1

Sample Description	Air Quality						
Location	บ้านนาตาพูด (GPS 47P 0735346, 1406705)						
Parameter	Nitrogen dioxide (ppm)						
Measurement Date	Oct 25, 2022 - Nov 01, 2022						
Measurement by	Sitpawit Suwannarat						
Time	22119512-1 Oct 25, 2022	22119512-2 Oct 26, 2022	22119512-3 Oct 27, 2022	22119512-4 Oct 28, 2022	22119512-5 Oct 29, 2022	22119512-6 Oct 30, 2022	22119512-7 Oct 31, 2022
09:00 AM - 10:00 AM	0.002	0.002	0.001	<0.001	0.002	0.001	0.013
10:00 AM - 11:00 AM	0.002	0.002	<0.001	0.001	0.001	0.001	0.015
11:00 AM - 12:00 PM	0.003	0.001	<0.001	0.003	0.001	0.001	0.016
12:00 PM - 01:00 PM	0.002	0.001	0.001	0.002	0.001	0.002	0.016
01:00 PM - 02:00 PM	0.002	<0.001	0.001	<0.001	0.001	0.003	0.021
02:00 PM - 03:00 PM	0.002	0.001	0.001	<0.001	0.002	0.004	0.012
03:00 PM - 04:00 PM	0.003	0.002	0.001	0.001	0.002	0.002	0.008
04:00 PM - 05:00 PM	0.003	0.002	0.002	0.002	0.002	0.001	0.007
05:00 PM - 06:00 PM	0.003	0.002	0.001	0.001	0.002	0.017	0.007
06:00 PM - 07:00 PM	0.002	0.002	0.001	0.001	0.002	0.009	0.006
07:00 PM - 08:00 PM	0.018	0.002	0.001	0.001	0.002	0.007	0.012
08:00 PM - 09:00 PM	0.001	0.001	<0.001	0.001	0.001	0.009	0.010
09:00 PM - 10:00 PM	0.001	<0.001	<0.001	<0.001	0.001	0.010	0.009
10:00 PM - 11:00 PM	0.001	<0.001	<0.001	<0.001	<0.001	0.012	0.015
11:00 PM - 12:00 AM	0.001	<0.001	<0.001	<0.001	<0.001	0.006	0.016
12:00 AM - 01:00 AM	0.001	<0.001	<0.001	<0.001	<0.001	0.010	0.022
01:00 AM - 02:00 AM	0.001	<0.001	0.001	<0.001	<0.001	0.009	0.017
02:00 AM - 03:00 AM	0.001	0.001	0.001	<0.001	<0.001	0.013	0.023
03:00 AM - 04:00 AM	0.001	0.002	0.002	0.001	<0.001	0.013	0.009
04:00 AM - 05:00 AM	0.002	0.002	0.001	0.002	<0.001	0.012	0.007
05:00 AM - 06:00 AM	0.002	0.002	0.001	0.002	0.001	0.017	0.005
06:00 AM - 07:00 AM	0.002	0.001	0.001	0.002	0.001	0.024	0.008
07:00 AM - 08:00 AM	0.002	0.001	<0.001	0.002	0.001	0.021	0.006
08:00 AM - 09:00 AM	0.002	0.001	<0.001	0.002	0.001	0.015	0.009
Average	0.003	0.001	0.001	0.001	0.001	0.009	0.012
1hr - Maximum	0.018	0.002	0.002	0.003	0.002	0.024	0.023
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 EPAMethod Part 50 App. F (Chemiluminescence)

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Approved by

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Saranya Chalerthamrong
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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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID : 22119537

Date Received : Nov 01, 2022

Date Reported : Nov 09, 2022

Report Number : 2447520-1

Page 1 of 2

Sample Number : 22119537-1 to 7
Parameter : Wind Speed / Wind Direction
Location : บ้านนาตาพุด (GPS 47P 0735346, 1406705)
Sampling Date : Oct 25 - Nov 01, 2022
Sampling by : Sitpawit Suwannarat

Time	Oct 25 - Oct 26, 2022			Oct 26 - Oct 27, 2022			Oct 27 - Oct 28, 2022			Oct 28 - Oct 29, 2022			Oct 29 - Oct 30, 2022			Oct 30 - Oct 31, 2022			Oct 31 - Nov 01, 2022		
	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)	
09:00 AM - 10:00 AM	1.5	124.0	SE	1.3	45.0	NE	0.7	87.0	E	2.3	89.0	E	1.2	49.0	NE	0.7	195.0	SSW	0.9	63.0	ENE
10:00 AM - 11:00 AM	1.1	72.0	ENE	1.5	307.0	NW	0.8	66.0	ENE	0.5	187.0	S	2.1	106.0	ESE	0.4	222.0	SW	1.7	163.0	SSE
11:00 AM - 12:00 PM	0.0	-	-	1.2	68.0	ENE	2.2	148.0	SSE	0.2	-	-	1.6	84.0	E	0.3	298.0	WNW	2.4	64.0	ENE
12:00 PM - 01:00 PM	0.4	46.0	NE	0.2	-	-	0.7	78.0	ENE	0.5	90.0	E	2.4	183.0	S	0.3	89.0	E	2.2	74.0	ENE
01:00 PM - 02:00 PM	0.6	284.0	WNW	1.8	171.0	S	0.5	293.0	WNW	0.3	110.0	ESE	0.0	-	-	0.3	319.0	NW	0.9	101.0	E
02:00 PM - 03:00 PM	0.8	276.0	W	0.5	206.0	SSW	0.8	87.0	E	3.6	218.0	SW	0.5	223.0	SW	0.0	-	-	0.7	226.0	SW
03:00 PM - 04:00 PM	0.2	-	-	3.6	72.0	ENE	0.9	185.0	S	0.3	6.0	N	0.8	108.0	ESE	0.8	48.0	NE	1.0	197.0	SSW
04:00 PM - 05:00 PM	0.0	-	-	0.3	307.0	NW	0.4	157.0	SSE	0.3	304.0	NW	1.0	106.0	ESE	0.0	-	-	0.3	64.0	ENE
05:00 PM - 06:00 PM	0.3	299.0	WNW	0.3	301.0	WNW	0.4	73.0	ENE	0.6	52.0	NE	0.1	-	-	0.6	58.0	ENE	0.3	92.0	E
06:00 PM - 07:00 PM	0.4	298.0	WNW	0.5	278.0	W	0.0	-	-	1.6	75.0	ENE	0.0	-	-	0.8	274.0	W	0.4	306.0	NW
07:00 PM - 08:00 PM	0.0	-	-	0.3	109.0	ESE	0.3	119.0	ESE	2.1	112.0	ESE	0.3	40.0	NE	1.0	76.0	ENE	0.0	-	-
08:00 PM - 09:00 PM	0.3	290.0	WNW	1.4	278.0	W	0.3	90.0	E	0.3	272.0	W	0.2	-	-	0.9	75.0	ENE	0.0	-	-
09:00 PM - 10:00 PM	0.4	216.0	SW	0.5	284.0	WNW	0.4	65.0	ENE	0.3	58.0	ENE	0.9	27.0	NNE	1.6	67.0	ENE	0.0	-	-
10:00 PM - 11:00 PM	0.4	60.0	ENE	0.3	96.0	E	0.6	275.0	W	0.8	105.0	ESE	0.3	293.0	WNW	0.3	74.0	ENE	0.3	107.0	ESE
11:00 PM - 12:00 AM	0.6	271.0	W	0.0	-	-	0.3	294.0	WNW	0.0	-	-	0.0	-	-	0.4	284.0	WNW	0.4	76.0	ENE
12:00 AM - 01:00 AM	0.3	287.0	WNW	0.8	115.0	ESE	0.3	310.0	NW	0.3	156.0	SSE	0.4	131.0	SE	0.3	303.0	WNW	1.2	78.0	ENE
01:00 AM - 02:00 AM	1.2	65.0	ENE	0.4	121.0	ESE	0.0	-	-	0.2	-	-	0.4	228.0	SW	0.3	86.0	E	0.8	69.0	ENE
02:00 AM - 03:00 AM	0.3	39.0	NE	0.0	-	-	0.4	288.0	WNW	1.0	74.0	ENE	1.0	156.0	SSE	0.3	162.0	SSE	0.0	-	-
03:00 AM - 04:00 AM	0.4	294.0	WNW	0.3	236.0	SW	0.4	80.0	E	1.5	132.0	SE	0.6	250.0	WSW	0.4	253.0	WSW	0.6	95.0	E
04:00 AM - 05:00 AM	0.0	-	-	0.4	104.0	ESE	0.3	133.0	SE	0.0	-	-	0.6	151.0	SSE	0.4	258.0	WSW	0.5	275.0	W
05:00 AM - 06:00 AM	1.1	294.0	WNW	0.3	93.0	E	0.5	157.0	SSE	1.1	109.0	ESE	1.1	78.0	ENE	0.3	92.0	E	0.3	70.0	ENE
06:00 AM - 07:00 AM	0.7	284.0	WNW	1.6	66.0	ENE	1.5	124.0	SE	0.4	91.0	E	0.5	69.0	ENE	1.5	78.0	ENE	1.6	114.0	ESE
07:00 AM - 08:00 AM	0.9	36.0	NE	1.4	61.0	ENE	1.5	154.0	SSE	1.5	96.0	E	1.2	359.0	N	1.6	105.0	ESE	0.9	110.0	ESE
08:00 AM - 09:00 AM	0.2	-	-	0.9	0.0	N	1.9	267.0	W	1.0	92.0	E	0.3	61.0	ENE	1.2	179.0	S	0.4	95.0	E

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Approved by

Sarayuth Jitranont
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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID : 22119537

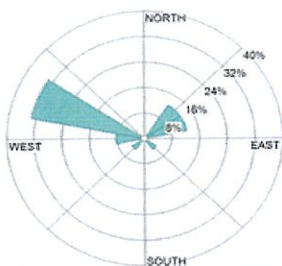
Date Received : Nov 01, 2022

Date Reported : Nov 09, 2022

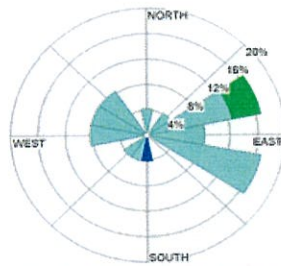
Report Number : 2447520-1

Page 2 of 2

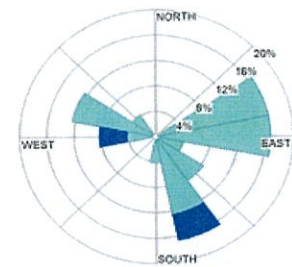
Wind Rose



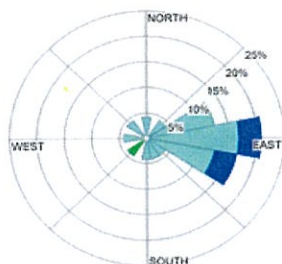
Date : Oct 25-26, 2022



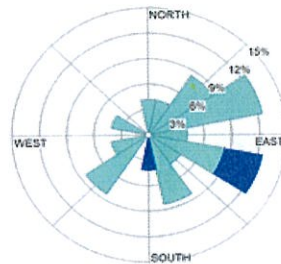
Date : Oct 26-27, 2022



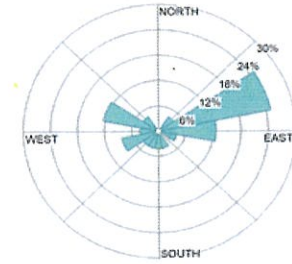
Date : Oct 27-28, 2022



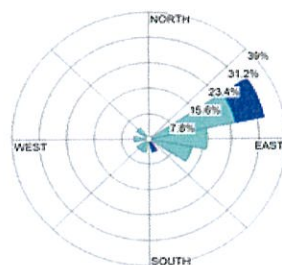
Date : Oct 28-29, 2022



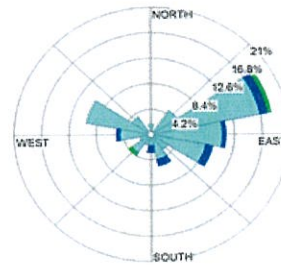
Date : Oct 29-30, 2022



Date : Oct 30-31, 2022



Date : Oct 31-Nov 01, 2022



Date : Oct 25-Nov 01, 2022

WS(m/s)	%
≥ 10.0	0.00
8.0-10.0	0.00
5.5-8.0	0.00
3.3-5.5	1.19
1.7-3.3	5.95
0.3-1.7	77.38
Calms	15.48

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Approved by

Sarayuth Jitranont
Assistant General Manager

ภาคผนวก ค-3

คุณภาพน้ำ



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 : 4513256049

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

Lot ID: 2270890

Date Received : Jul 06, 2022

Date Reported : Jul 15, 2022

Report Number : 2338389-1

Page 1 of 1

Sample Number	2270890-1
Sampled Date	Jul 06, 2022 10:50 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Jul 06, 2022
Condition of Sample	Contained in two amber glass bottles, 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	<2	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	25	≤120	APHA (2017), 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	8	≤300	APHA (2017), 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	8	≤300	APHA (2017), 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C	-	-	-	7.9	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	34.4	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	756	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Rayong

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

Sampled By : Pathompong Kornawat , Thanasoun Namakunna

Remark :

- LOD : Limit of Detection
- "<" : 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. Banchongkit

Narumon Banchongkit

Supervisor

ทะเบียนเลขที่ ๖-323-๖-9445

Approved by

D. Changchon

Dej Changchon

Senior Manager

ทะเบียนเลขที่ ๖-323-๖-9442

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2270890

Date Received : Jul 06, 2022

Date Reported : Jul 15, 2022

Report Number : 2338389-2

Client : Siam Styrene Monomer Co., Ltd.

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

P/O : 4513256049

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

Page 1 of 2

Sample Number	2270890-1
Sampled Date	Jul 06, 2022 10:50 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Jul 08, 2022
Condition of Sample	Contained in two amber glass bottles, 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	Based on US EPA, Method 5030B and 8260D	Bangkok
1,1,2-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,1-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,2-Dichloroethane	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,3-Dichloropropane	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Benzene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Carbontetrachloride	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
cis-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Ethylbenzene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Hexachlorobutadiene *	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Methyl Chloride	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Methylene Chloride (Dichloromethane)	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Tetrachloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Toluene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Total Xylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
trans-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok

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Approved by

Siriluk P.

Siriluk Puengpang
Supervisor

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Analysis / Test Report

TESTING

No.0009

Client : Siam Styrene Monomer Co., Ltd.

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

P/O : 4513256049

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

Lot ID: 2270890

Date Received : Jul 06, 2022

Date Reported : Jul 15, 2022

Report Number : 2338389-2

Page 2 of 2

Sample Number	2270890-1
Sampled Date	Jul 06, 2022 10:50 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Jul 08, 2022
Condition of Sample	Contained in two amber glass bottles, 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							
Trichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Vinyl chloride	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	9.32	No Standard	Based on APHA (2017), 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).

Sampled By : Pathompong Kornawat , Thanasoun Namakunna

Remark :

- LOD : Limit of Detection
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Siriluk P.

Siriluk Puengpang
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Analysis / Test Report

TESTING
No.0042

Lot ID: 2284530

Date Received : Aug 03, 2022

Date Reported : Aug 11, 2022

Report Number : 2369728-1

Client : Siam Styrene Monomer Co., Ltd.

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

P/O : 4513256049

Project Name : Water Testing

Project Location : Map Ta Phut_EBSM (SSMC)

Page 1 of 1

Sample Number 2284530-1
Sampled Date Aug 03, 2022 11:10 AM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Aug 03, 2022
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	<2	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	18	≤120	APHA (2017), 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	5	≤300	APHA (2017), 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	<5	≤300	APHA (2017), 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.2	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	32.1	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	572	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Rayong

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

Sampled By : Pathompong Kornasawat, 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.

Technical Management

N. Banchongkit

Narumon Banchongkit

Supervisor

ทะเบียนเลขที่ ๖-323-จ-9445

Approved by

D. Changchon

Dej Changchon

Senior Manager

ทะเบียนเลขที่ ๖-323-ค-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 : 4513256049

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

TESTING

No.0009

Lot ID: 2284530

Date Received : Aug 03, 2022

Date Reported : Aug 11, 2022

Report Number : 2369728-2

Page 1 of 2

Sample Number	2284530-1
Sampled Date	Aug 03, 2022 11:10 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Aug 04, 2022
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	Based on US EPA, Method 5030B and 8260D	Bangkok
1,1,2-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,1-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,2-Dichloroethane	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,3-Dichloropropane *	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Benzene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Carbontetrachloride	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
cis-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Ethylbenzene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Hexachlorobutadiene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Methyl Chloride	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Methylene Chloride (Dichloromethane)	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Tetrachloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Toluene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Total Xylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
trans-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok

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Approved by

Siriluk P.

Siriluk Puengpang
Supervisor

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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 : 4513256049
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)

TESTING
No.0009

Lot ID: 2284530

Date Received : Aug 03, 2022

Date Reported : Aug 11, 2022

Report Number : 2369728-2

Page 2 of 2

Sample Number 2284530-1
Sampled Date Aug 03, 2022 11:10 AM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Aug 04, 2022
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							
Trichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Vinyl chloride	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	7.39	No Standard	Based on APHA (2017), 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).

Sampled By : Pathompong Kornawat , Thanasoun Namakunna

Remark :

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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Siriluk P.

Siriluk Puengpang
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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 : 4513256049

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

Lot ID: 2296685

Date Received : Sep 07, 2022

Date Reported : Sep 15, 2022

Report Number : 2397599-1

Page 1 of 1

Sample Number	2296685-1
Sampled Date	Sep 07, 2022 2:25 PM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Sep 07, 2022
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	<2	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	<5	≤120	APHA (2017), 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	<5	≤300	APHA (2017), 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	<5	≤300	APHA (2017), 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.1	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	28.4	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	164	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Rayong

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

Sampled By : Wanlop Hunchainaow , 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.

Technical Management

N. Banchongkit

Narumon Banchongkit
Supervisor

ทะเบียนเลขที่ 7-323-จ-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager

ทะเบียนเลขที่ 7-323-ค-9442

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2296685

Date Received : Sep 07, 2022

Date Reported : Sep 15, 2022

Report Number : 2397599-2

Client : Siam Styrene Monomer Co., Ltd.

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

P/O : 4513256049

Project Name : Water Testing

Project Location : Map Ta Phut_EBSM (SSMC)

Page 1 of 2

Sample Number 2296685-1
Sampled Date Sep 07, 2022 2:25 PM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Sep 08, 2022
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	Based on US EPA, Method 5030B and 8260D	Bangkok
1,1,2-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,1-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,2-Dichloroethane	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,3-Dichloropropane *	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Benzene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Carbontetrachloride	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
cis-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Ethylbenzene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Hexachlorobutadiene *	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Methyl Chloride *	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Methylene Chloride (Dichloromethane)	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Tetrachloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Toluene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Total Xylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
trans-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok

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Analysis / Test Report

TESTING

No.0009

Lot ID: 2296685

Date Received : Sep 07, 2022

Date Reported : Sep 15, 2022

Report Number : 2397599-2

Client : Siam Styrene Monomer Co., Ltd.

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

P/O : 4513256049

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

Page 2 of 2

Sample Number	2296685-1
Sampled Date	Sep 07, 2022 2:25 PM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Sep 08, 2022
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							
Trichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	3.01	No Standard	Based on APHA (2017), 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).

Sampled By : Wanlop Hunchainaow , Thanasoun Namakunna

Remark :

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Analysis / Test Report

TESTING

No.0042

Lot ID: 22110969

Date Received : Oct 04, 2022

Date Reported : Oct 11, 2022

Report Number : 2427389-1

Client : Siam Styrene Monomer Co., Ltd.

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

P/O : 4513256049

Project Name : Water Testing

Project Location : Map Ta Phut_EBSM (SSMC)

Page 1 of 1

Sample Number	22110969-1
Sampled Date	Oct 04, 2022 10:30 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Oct 04, 2022
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	<2	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	26	≤120	APHA (2017), 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	10	≤300	APHA (2017), 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	10	≤300	APHA (2017), 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.4	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	32.0	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	688	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Rayong

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

Sampled By : Wanlop Hunchainaow , Thanasoun Namakunna

Remark :

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Technical Management

N. Banchongkit

Narumon Banchongkit

Supervisor

ทะเบียนเลขที่ ๖-323-๖-9445

Approved by

D. Changchon

Dej Changchon

Senior Manager

ทะเบียนเลขที่ 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 : 4513256049

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

Lot ID: 22110969

Date Received : Oct 04, 2022

Date Reported : Oct 12, 2022

Report Number : 2427389-2

Page 1 of 2

Sample Number	22110969-1
Sampled Date	Oct 04, 2022 10:30 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Oct 06, 2022
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	Based on US EPA, Method 5030B and 8260D	Bangkok
1,1,2-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,1-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,2-Dichloroethane	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,3-Dichloropropane	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Benzene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Carbontetrachloride	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
cis-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Ethylbenzene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Hexachlorobutadiene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Methyl Chloride	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Methylene Chloride (Dichloromethane)	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Tetrachloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Toluene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Total Xylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
trans-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok

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Siriluk P.

Siriluk Puengpang
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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 : 4513256049

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

Lot ID: 22110969

Date Received : Oct 04, 2022

Date Reported : Oct 12, 2022

Report Number : 2427389-2

Page 2 of 2

Sample Number 22110969-1
Sampled Date Oct 04, 2022 10:30 AM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Oct 06, 2022
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							
Trichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Water Testing							
Total Organic Carbon	mg/L	0.01	0.1	11.2	No Standard	Based on APHA (2017), 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).

Sampled By : Wanlop Hunchainaow , Thanasoun Namakunna

Remark :

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Siriluk P.

Siriluk Puengpang
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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 : 4513256049
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)

TESTING
No.0042
Lot ID: 22121773
Date Received : Nov 01, 2022
Date Reported : Nov 09, 2022
Report Number : 2452485-1

Page 1 of 1

Sample Number 22121773-1
Sampled Date Nov 01, 2022 11:30 AM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Nov 01, 2022
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	<2	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	25	≤120	APHA (2017), 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	8	≤300	APHA (2017), 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	7	≤300	APHA (2017), 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	8.3	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	31.5	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	532	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Rayong

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

Sampled By : Wanlop Hunchainaow , Thanasoun Namakunna

Remark :

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Technical Management

N. Banchongkit

Narumon Banchongkit
Supervisor

ทะเบียนเลขที่ ว-323-จ-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-ค-9442

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Analysis / Test Report

TESTING

No.0009

Lot ID: 22121773

Date Received : Nov 01, 2022

Date Reported : Nov 09, 2022

Report Number : 2452485-2

Client : Siam Styrene Monomer Co., Ltd.

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

P/O : 4513256049

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

Page 1 of 2

Sample Number	22121773-1
Sampled Date	Nov 01, 2022 11:30 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Nov 03, 2022
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	Based on US EPA, Method 5030B and 8260D	Bangkok
1,1,2-Trichloroethane	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,1-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,2-Dichloroethane *	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
1,3-Dichloropropane *	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Benzene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Carbontetrachloride	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
cis-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Ethylbenzene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Hexachlorobutadiene *	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Methyl Chloride	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Methylene Chloride (Dichloromethane)	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Tetrachloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Toluene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Total Xylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
trans-1,2-Dichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok

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Siriluk Puengpang
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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 : 4513256049

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

TESTING

No.0009

Lot ID: 22121773

Date Received : Nov 01, 2022

Date Reported : Nov 09, 2022

Report Number : 2452485-2

Page 2 of 2

Sample Number	22121773-1						
Sampled Date	Nov 01, 2022 11:30 AM						
Sample Description	Wastewater						
Location	AZ-1						
Date Analysis Commenced	Nov 03, 2022						
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							
Trichloroethylene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	8.17	No Standard	Based on APHA (2017), 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).

Sampled By : Wanlop Hunchainaow , Thanasoun Namakunna

Remark :

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Approved by

Siriluk P.

Siriluk Puengpang
Supervisor

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Analysis / Test Report

TESTING
No.0042

Lot ID: 22136117

Date Received : Dec 09, 2022

Date Reported : Dec 17, 2022

Report Number : 2486123-1

Client : Siam Styrene Monomer Co., Ltd.

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

P/O : 4513256049

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

Page 1 of 2

Sample Number	22136117-1
Sampled Date	Dec 09, 2022 10:50 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Dec 09, 2022
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	<2	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	5	33	≤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	9	≤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	9	≤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 *		-	-	7.4	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	-	-	32.9	≤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	940	≤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

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).

Technical Management

N. Banchongkit

Narumon Banchongkit

Supervisor

ทะเบียนเลขที่ ๖-323-๖-9445

Approved by

D. Changchon

Dej Changchon

Senior Manager

ทะเบียนเลขที่ 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 : 4513256049

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

TESTING

No.0042

Lot ID: 22136117

Date Received : Dec 09, 2022

Date Reported : Dec 17, 2022

Report Number : 2486123-1

Page 2 of 2

Sampling By : Tanasit Wongsachai ทะเบียนเลขที่ ว-323-จ-9460 , Thanasoun Namakunna ทะเบียนเลขที่ ว-204-จ-8592

Remark :

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

Technical Management

N. Banchongkit

Narumon Banchongkit
Supervisor

ทะเบียนเลขที่ ว-323-จ-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-ค-9442

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Analysis / Test Report

TESTING

No.0009

Lot ID: 22136117

Date Received : Dec 09, 2022

Date Reported : Dec 17, 2022

Report Number : 2486123-2

Client : Siam Styrene Monomer Co., Ltd.

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

P/O : 4513256049

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

Page 1 of 3

Sample Number	22136117-1
Sampled Date	Dec 09, 2022 10:50 AM
Sample Description	Wastewater
Location	AZ-1
Date Analysis Commenced	Dec 12, 2022
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

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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 : 4513256049
Project Name : Water Testing
Project Location: Map Ta Phut_EBSM (SSMC)

TESTING
No.0009

Lot ID: 22136117
Date Received : Dec 09, 2022
Date Reported : Dec 17, 2022
Report Number : 2486123-2

Page 2 of 3

Sample Number 22136117-1
Sampled Date Dec 09, 2022 10:50 AM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Dec 12, 2022
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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Approved by

Nanthawadee Somboon
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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 : 4513256049
Project Name : Water Testing
Project Location : Map Ta Phut_EBSM (SSMC)

TESTING
No.0009

Lot ID: 22136117

Date Received : Dec 09, 2022

Date Reported : Dec 17, 2022

Report Number : 2486123-2

Page 3 of 3

Sample Number 22136117-1
Sampled Date Dec 09, 2022 10:50 AM
Sample Description Wastewater
Location AZ-1
Date Analysis Commenced Dec 12, 2022
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	12.4	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 : Tanasit Wongsachai ทะเนษิตวงศ์ ๖-323-๖-9460 , Thanasoun Namakunna ทะเนษิตวงศ์ ๖-204-๖-8592

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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 : 4503142326

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

Lot ID: 2270897

Date Received : Jul 06, 2022

Date Reported : Dec 22, 2022

Report Number : 2338398-1 C6

Page 1 of 1

Sample Number 2270897-1
Sampling Date Jul 06, 2022 11:00 AM
Sample Description Wastewater
Location Outfall
Date Analysis Commenced Jul 06, 2022
Condition of Sample Contained in two amber glass bottles, 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	<2	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	22	≤120	APHA (2017), 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	13	≤300	APHA (2017), 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	13	≤300	APHA (2017), 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	8.2	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	32.9	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	780	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Rayong

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

Sampling By : Pathompong Kornasawat, Thanasoun Namakunna

Remark :

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Technical Management

N. Banchongkit

Narumon Banchongkit

Supervisor

ทะเบียนเลขที่ ว-323-จ-9445

Approved by

D. Changchon

Dej Changchon

Senior Manager

ทะเบียนเลขที่ ว-323-ค-9442

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Analysis / Test Report

TESTING
No.0009

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)

Lot ID: 2270897

Date Received : Jul 06, 2022
Date Reported : Dec 22, 2022
Report Number : 2338398-3C6

Page 1 of 1

Sample Number 2270897-1
Sampling Date Jul 06, 2022 11:00 AM
Sample Description Wastewater
Location Outfall
Date Analysis Commenced Jul 07, 2022
Condition of Sample Contained in two amber glass bottles, 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	Based on US EPA, Method 5030B and 8260D	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	8.21	No Standard	Based on APHA (2017), 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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Siriluk P.

Siriluk Puengpang
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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 : 4503142326

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

Lot ID: 2284532

Date Received : Aug 03, 2022

Date Reported : Aug 11, 2022

Report Number : 2369730-1 C6

Page 1 of 1

Sample Number	2284532-1
Sampling Date	Aug 03, 2022 11:30 AM
Sample Description	Wastewater
Location	Outfall
Date Analysis Commenced	Aug 03, 2022
Condition of Sample	Contained in two amber glass bottles, 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	<2	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	18	≤120	APHA (2017), 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	7	≤300	APHA (2017), 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	6	≤300	APHA (2017), 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.4	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.9	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	282	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	7	≤50	APHA (2017), 2540 D	Rayong

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

Sampling By : Pathompong Kornawat , Thanasoun Namakunna

Remark :

- LOD : Limit of Detection
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Technical Management

N. Banchongkit

Narumon Banchongkit

Supervisor

ทะเบียนเลขที่ ว-323-จ-9445

Approved by

D. Changchon

Dej Changchon

Senior Manager

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2270897

Date Received : Aug 03, 2022

Date Reported : Aug 11, 2022

Report Number : 2369730-3 C6

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)

Page 1 of 1

Sample Number	2284532-1
Sampling Date	Aug 03, 2022 11:30 AM
Sample Description	Wastewater
Location	Outfall
Date Analysis Commenced	Aug 04, 2022
Condition of Sample	Contained in two amber glass bottles, 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	Based on US EPA, Method 5030B and 8260D	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	4.02	No Standard	Based on APHA (2017), 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 Kornasawat , Thanasoun Namakunna

Remark :

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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 : 4503142326

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

Lot ID: 2296689

Date Received : Sep 07, 2022

Date Reported : Sep 15, 2022

Report Number : 2397601-1 C6

Page 1 of 1

Sample Number	2296689-1
Sampling Date	Sep 07, 2022 2:10 PM
Sample Description	Wastewater
Location	Outfall
Date Analysis Commenced	Sep 07, 2022
Condition of Sample	Contained in six glass vials, four amber glass bottles and eight 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	<2	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	5	≤120	APHA (2017), 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	<5	≤300	APHA (2017), 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	<5	≤300	APHA (2017), 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.2	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	28.2	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	178	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Rayong

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

Sampling By : Wanlop Hunchainaow , Thanasoun Namakunna

Remark :

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Technical Management

N. Banchongkit

Narumon Banchongkit
Supervisor

ทะเบียนเลขที่ ว-323-จ-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-ค-9442

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Analysis / Test Report

TESTING
No.0009

Lot ID: 2296689

Date Received : Sep 07, 2022

Date Reported : Sep 15, 2022

Report Number : 2397601-3 C6

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)

Page 1 of 1

Sample Number 2296689-1
Sampling Date Sep 07, 2022 2:10 PM
Sample Description Wastewater
Location Outfall
Date Analysis Commenced Sep 08, 2022
Condition of Sample Contained in six glass vials, four amber glass bottles and eight 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	Based on US EPA, Method 5030B and 8260D	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	3.09	No Standard	Based on APHA (2017), 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 Hunchainaow , Thanasoun Namakunna

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Analysis / Test Report

TESTING

No.0042

Lot ID: 22110977

Date Received : Oct 04, 2022

Date Reported : Dec 22, 2022

Report Number : 2427394-1 C6

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)

Page 1 of 1

Sample Number 22110977-1
Sampling Date Oct 04, 2022 10:10 AM
Sample Description Wastewater
Location Outfall
Date Analysis Commenced Oct 04, 2022
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	<2	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	18	≤120	APHA (2017), 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	9	≤300	APHA (2017), 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	9	≤300	APHA (2017), 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.2	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.7	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	326	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Rayong

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

Sampling By : Wanlop Hunchainaow , Thanasoun Namakunna

Remark :

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Technical Management

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Narumon Banchongkit
Supervisor

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Approved by

D. Changchon

Dej Changchon
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Analysis / Test Report

TESTING
No.0009

Lot ID: 22110977

Date Received : Oct 04, 2022

Date Reported : Dec 22, 2022

Report Number : 2427394-3C6

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)

Page 1 of 1

Sample Number 22110977-1
Sampling Date Oct 04, 2022 10:10 AM
Sample Description Wastewater
Location Outfall
Date Analysis Commenced Oct 05, 2022
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	Based on US EPA, Method 5030B and 8260D	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	7.63	No Standard	Based on APHA (2017), 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 Hunchainaow , Thanasoun Namakunna

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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 : 4503142326

Project Name : Water Testing

Project Location: Map Ta Phut_EBSM (SSMC)

Lot ID: 22121774

Date Received : Nov 01, 2022

Date Reported : Dec 22, 2022

Report Number : 2452487-1 Rev. No.1 Cf

Page 1 of 1

Sample Number	22121774-1
Sampling Date	Nov 01, 2022 11:09 AM
Sample Description	Wastewater
Location	Outfall
Date Analysis Commenced	Nov 01, 2022
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	<2	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	31	≤120	APHA (2017), 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	9	≤300	APHA (2017), 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	8	≤300	APHA (2017), 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	8.2	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	30.5	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	404	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Rayong

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

Note : This Analysis test report is reissued to supersede report No.2452487-3, Date Reported : Nov 09, 2022 due to revise sample information.

Sampling By : Wanlop Hunchainaow , Thanasoun Namakunna

Remark :

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Approved by

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Senior Manager

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Analysis / Test Report

TESTING
No.0009

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)

Lot ID: 22121774

Date Received : Nov 01, 2022
Date Reported : Dec 22, 2022
Report Number : 2452487-3 Rev. No.1C6

Page 1 of 1

Sample Number 22121774-1
Sampling Date Nov 01, 2022 11:09 AM
Sample Description Wastewater
Location Outfall
Date Analysis Commenced Nov 02, 2022
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	Based on US EPA, Method 5030B and 8260D	Bangkok
Styrene	ug/L	1.5	5	Not Detected	No Standard	Based on US EPA, Method 5030B and 8260D	Bangkok
Water Testing							
Total Organic Carbon *	mg/L	0.01	0.1	8.00	No Standard	Based on APHA (2017), 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 : This Analysis test report is reissued to supersede report No.2452487-3, Date Reported : Nov 09, 2022 due to revise sample information.

Sampling By : Wanlop Hunchainaow , Thanasoun Namakunna

Remark :

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

Lot ID: 22136120

Date Received : Dec 09, 2022
Date Reported : Dec 19, 2022
Report Number : 2486131-1 C6

Page 1 of 2

Sample Number 22136120-1
Sampling Date Dec 09, 2022 10:30 AM
Sample Description Wastewater
Location Outfall
Date Analysis Commenced Dec 09, 2022
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	<2	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	5	27	≤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	17	≤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	15	≤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	-	-	30.8	≤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	820	≤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

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).

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Approved by

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Analysis / Test Report

TESTING

No.0042

Lot ID: 22136120

Date Received : Dec 09, 2022

Date Reported : Dec 19, 2022

Report Number : 2486131-1 C6

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)

Page 2 of 2

Sampling By : Tanasit Wongsachai , Thanasoun Namakunna

Remark :

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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)

Lot ID: 22136120

Date Received : Dec 09, 2022

Date Reported : Dec 19, 2022

Report Number : 2486131-3 C6

Page 1 of 1

Sample Number	22136120-1						
Sampling Date	Dec 09, 2022 10:30 AM						
Sample Description	Wastewater						
Location	Outfall						
Date Analysis Commenced	Dec 10, 2022						
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	11.4	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 : Tanasit Wongsachai , Thanasoun Namakunna

Remark :

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

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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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2291791

Date Received : Aug 19, 2022

Date Reported : Aug 24, 2022

Report Number: 2413247-1

Page 1 of 1

Sample Number 2291791-1
Parameter Noise (Leq 24 hrs.)
Location บริเวณรั้วโครงการฝั่งตะวันออก
Measurement Date Aug 15 - Aug 16, 2022
Measurement by Sawai Tonpho
Sound Level meter Serial No. 1122579

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	68.8	97.3	67.6
11:00 AM - 12:00 PM	68.1	75.4	67.8
12:00 PM - 01:00 PM	68.2	76.9	67.8
01:00 PM - 02:00 PM	68.2	78.8	67.8
02:00 PM - 03:00 PM	68.4	78.0	68.0
03:00 PM - 04:00 PM	68.4	74.2	68.1
04:00 PM - 05:00 PM	68.4	70.7	68.1
05:00 PM - 06:00 PM	68.1	73.8	67.7
06:00 PM - 07:00 PM	67.9	71.1	67.6
07:00 PM - 08:00 PM	68.3	69.9	68.0
08:00 PM - 09:00 PM	68.6	79.0	68.1
09:00 PM - 10:00 PM	68.9	76.6	68.5
10:00 PM - 11:00 PM	69.3	70.7	69.0
11:00 PM - 12:00 AM	69.4	71.0	69.0
12:00 AM - 01:00 AM	69.4	70.6	69.1
01:00 AM - 02:00 AM	69.1	70.4	68.8
02:00 AM - 03:00 AM	69.1	70.3	68.7
03:00 AM - 04:00 AM	69.0	70.1	68.7
04:00 AM - 05:00 AM	68.9	70.0	68.7
05:00 AM - 06:00 AM	69.0	70.3	68.8
06:00 AM - 07:00 AM	69.0	75.5	68.7
07:00 AM - 08:00 AM	69.0	81.9	68.5
08:00 AM - 09:00 AM	68.4	74.7	68.0
09:00 AM - 10:00 AM	68.5	81.2	68.1

Leq Average 24 hrs. (dB(A)) 68.7
Lmax (dB(A)) 97.3
L90 (dB(A)) 68.1
Ldn (dB(A)) 75.5
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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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 : 4513256049
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2291791
Date Received : Aug 19, 2022
Date Reported : Aug 24, 2022
Report Number: 2413248-1

Page 1 of 1

Sample Number 2291791-2
Parameter Noise (Leq 24 hrs.)
Location บริเวณเริ่มรั้วโครงการฝั่งตะวันออก
Measurement Date Aug 16 - Aug 17, 2022
Measurement by Sawai Tonpho
Sound Level meter Serial No. 1122579

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	68.4	71.9	68.0
11:00 AM - 12:00 PM	68.3	78.5	67.9
12:00 PM - 01:00 PM	68.3	72.1	68.0
01:00 PM - 02:00 PM	68.4	74.7	68.1
02:00 PM - 03:00 PM	68.4	70.9	68.1
03:00 PM - 04:00 PM	68.3	74.2	67.9
04:00 PM - 05:00 PM	68.2	81.3	67.7
05:00 PM - 06:00 PM	68.3	75.6	67.8
06:00 PM - 07:00 PM	68.2	73.2	67.9
07:00 PM - 08:00 PM	68.5	72.6	68.0
08:00 PM - 09:00 PM	68.4	73.6	68.0
09:00 PM - 10:00 PM	68.6	73.3	68.2
10:00 PM - 11:00 PM	68.6	72.9	68.3
11:00 PM - 12:00 AM	68.9	73.7	68.5
12:00 AM - 01:00 AM	68.7	70.4	68.4
01:00 AM - 02:00 AM	68.6	70.5	68.3
02:00 AM - 03:00 AM	68.5	70.9	68.2
03:00 AM - 04:00 AM	68.5	71.5	68.1
04:00 AM - 05:00 AM	68.6	71.9	68.3
05:00 AM - 06:00 AM	68.7	73.4	68.3
06:00 AM - 07:00 AM	68.6	72.8	68.1
07:00 AM - 08:00 AM	68.7	80.7	67.9
08:00 AM - 09:00 AM	68.1	73.5	67.7
09:00 AM - 10:00 AM	67.9	71.5	67.4

Leq Average 24 hrs. (dB(A)) 68.5
Lmax (dB(A)) 81.3
L90 (dB(A)) 68.0
Ldn (dB(A)) 75.0
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 Salamtah
Section Head

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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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2291791

Date Received : Aug 19, 2022

Date Reported : Aug 24, 2022

Report Number: 2413249-1

Page 1 of 1

Sample Number 2291791-3
Parameter Noise (Leq 24 hrs.)
Location บริเวณเริ่มรั้วโครงการฝั่งตะวันออก
Measurement Date Aug 17 - Aug 18, 2022
Measurement by Sawai Tonpho
Sound Level meter Serial No. 1122579

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	68.1	73.7	67.6
11:00 AM - 12:00 PM	67.9	71.5	67.5
12:00 PM - 01:00 PM	67.9	74.4	67.5
01:00 PM - 02:00 PM	68.3	86.3	67.5
02:00 PM - 03:00 PM	68.2	77.0	67.6
03:00 PM - 04:00 PM	68.4	81.9	67.8
04:00 PM - 05:00 PM	68.1	75.1	67.7
05:00 PM - 06:00 PM	68.2	72.7	67.9
06:00 PM - 07:00 PM	68.3	85.6	67.9
07:00 PM - 08:00 PM	68.4	69.8	68.0
08:00 PM - 09:00 PM	68.4	70.5	68.1
09:00 PM - 10:00 PM	68.4	72.1	68.1
10:00 PM - 11:00 PM	68.5	82.9	68.1
11:00 PM - 12:00 AM	68.4	71.9	68.1
12:00 AM - 01:00 AM	68.3	69.7	68.0
01:00 AM - 02:00 AM	68.4	72.4	68.1
02:00 AM - 03:00 AM	68.5	70.7	68.2
03:00 AM - 04:00 AM	68.5	69.7	68.2
04:00 AM - 05:00 AM	68.4	70.6	68.1
05:00 AM - 06:00 AM	68.5	72.7	68.2
06:00 AM - 07:00 AM	68.4	69.9	68.1
07:00 AM - 08:00 AM	68.2	80.1	67.8
08:00 AM - 09:00 AM	68.0	73.2	67.7
09:00 AM - 10:00 AM	67.9	76.6	67.5

Leq Average 24 hrs. (dB(A))

68.3

Lmax (dB(A))

86.3

L90 (dB(A))

67.9

Ldn (dB(A))

74.8

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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S:\Reports\Air Noise.rpt (11:43AM)

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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2291790

Date Received : Aug 17, 2022

Date Reported : Aug 18, 2022

Report Number: 2385948-1

Page 1 of 1

Sample Number 2291790-1
Parameter Noise (Leq 8 hrs.)
Location AT-3
Measurement Date Aug 15, 2022
Measurement by Sawai Tonpho

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:01 AM - 11:01 AM	84.2	102.7	81.1
11:01 AM - 12:01 PM	81.3	81.9	81.1
12:01 PM - 01:01 PM	81.5	82.2	81.4
01:01 PM - 02:01 PM	81.7	85.3	81.5
02:01 PM - 03:01 PM	81.7	83.8	81.5
03:01 PM - 04:01 PM	81.6	84.3	81.4
04:01 PM - 05:01 PM	81.7	82.8	81.5
05:01 PM - 06:01 PM	81.7	84.3	81.5

Leq Average 8 hrs. (dB(A))

82.0

Lmax (dB(A))

102.7

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๕๖

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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2291790

Date Received : Aug 17, 2022

Date Reported : Aug 18, 2022

Report Number: 2385948-2

Page 1 of 1

Sample Number : 2291790-2
Parameter : Noise (Leq 8 hrs.)
Location : FT-2
Measurement Date : Aug 15, 2022
Measurement by : Sawai Tonpho

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:31 AM - 10:31 AM	84.4	87.4	83.5
10:31 AM - 11:31 AM	84.2	87.1	83.3
11:31 AM - 12:31 PM	84.1	87.0	83.0
12:31 PM - 01:31 PM	84.2	87.5	83.0
01:31 PM - 02:31 PM	84.3	87.4	83.2
02:31 PM - 03:31 PM	84.5	87.8	83.2
03:31 PM - 04:31 PM	84.4	87.7	83.0
04:31 PM - 05:31 PM	84.6	91.0	83.2

Leq Average 8 hrs. (dB(A))

84.3

Lmax (dB(A))

91.0

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๔๖

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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 22119551

Date Received : Nov 23, 2022

Date Reported : Nov 28, 2022

Report Number: 2502990-1

Page 1 of 1

Sample Number 22119551-1
Parameter Noise (Leq 8 hrs.)
Location AT-3
Measurement Date Nov 23, 2022
Measurement by Sutdamrong Chokpitinan

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:23 AM - 10:23 AM	78.6	90.8	78.3
10:23 AM - 11:23 AM	78.3	87.5	78.1
11:23 AM - 12:23 PM	78.1	78.8	78.0
12:23 PM - 01:23 PM	78.1	78.6	77.9
01:23 PM - 02:23 PM	78.1	80.7	77.9
02:23 PM - 03:23 PM	78.7	89.0	77.9
03:23 PM - 04:23 PM	78.1	80.0	77.9
04:23 PM - 05:23 PM	78.7	89.0	77.9
Leq Average 8 hrs. (dB(A))	78.3		
Lmax (dB(A))		90.8	
Standard (dB(A))	90	140	
Reference Method : ISO1996-1 and 1996-2			
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๔๖			

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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 22119551

Date Received : Nov 23, 2022

Date Reported : Nov 28, 2022

Report Number: 2502991-1

Page 1 of 1

Sample Number 22119551-2
Parameter Noise (Leq 8 hrs.)
Location FT-2
Measurement Date Nov 23, 2022
Measurement by Sutdamrong Chokpitinan

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:10 AM - 10:10 AM	85.1	91.9	84.5
10:10 AM - 11:10 AM	85.0	89.1	84.4
11:10 AM - 12:10 PM	84.9	86.5	84.4
12:10 PM - 01:10 PM	84.7	86.8	84.3
01:10 PM - 02:10 PM	84.9	87.1	84.4
02:10 PM - 03:10 PM	84.9	88.2	84.4
03:10 PM - 04:10 PM	84.8	90.8	84.3
04:10 PM - 05:10 PM	85.1	91.4	84.5

Leq Average 8 hrs. (dB(A))

84.9

Lmax (dB(A))

91.9

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๔๖

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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2291788

Date Received : Aug 17, 2022

Date Reported : Aug 25, 2022

Report Number : 2385944-1

Page 1 of 3

Sample Number 2291788-1
Sampled Date Aug 15, 2022
Sample Description Air Quality
Location FT-3/CT-3
Date Analysis Commenced Aug 18, 2022
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 755 mmHg
Atmospheric Temperature 30.0 °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 Jiengwareewong

Remark :

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

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Approved by

Saranya C.

Saranya Chalermtamrong
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 : 4513256049
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2291788

Date Received : Aug 17, 2022
Date Reported : Aug 25, 2022
Report Number : 2385944-1

Page 2 of 3

Sample Number 2291788-2
Sampled Date Aug 15, 2022
Sample Description Air Quality
Location AT-3
Date Analysis Commenced Aug 18, 2022
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 755 mmHg
Atmospheric Temperature 30.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Benzene	09:40 AM - 11:40 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

Saranya C.

Saranya Chalermtamrong
Scientist (4)

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6506-83/ EMAIL



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 : 4513256049
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 2291788

Date Received : Aug 17, 2022
Date Reported : Aug 25, 2022
Report Number : 2385944-1

Page 3 of 3

Sample Number 2291788-3
Sampled Date Aug 15, 2022
Sample Description Air Quality
Location AT-4/AT-5
Date Analysis Commenced Aug 18, 2022
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 755 mmHg
Atmospheric Temperature 30.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Ethylbenzene	09:50 AM - 11:50 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)

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Approved by

Saranya C.

Saranya Chalermthamrong
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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 22119548

Date Received : Nov 24, 2022

Date Reported : Dec 02, 2022

Report Number : 2447545-1

Page 1 of 3

Sample Number 22119548-1
Sampled Date Nov 23, 2022
Sample Description Air Quality
Location FT-3/CT-3
Date Analysis Commenced Nov 25, 2022
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Styrene	09:00 AM - 11:00 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 : Ronnachai Moungrma

Remark :

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

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Saranya Chalermthamrong
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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 : 4513256049

Project Name : Environmental Quality Monitoring

Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 22119548

Date Received : Nov 24, 2022

Date Reported : Dec 02, 2022

Report Number : 2447545-1

Page 2 of 3

Sample Number 22119548-2
Sampled Date Nov 23, 2022
Sample Description Air Quality
Location AT-3
Date Analysis Commenced Nov 25, 2022
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Benzene	09:00 AM - 11:00 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 : Ronnachai Moungma

Remark :

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

Approved by

Saranya C.

Saranya Chalermthamrong
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 : 4513256049
Project Name : Environmental Quality Monitoring
Project Location : Map Ta Phut_EBSM (SSMC)

Lot ID: 22119548

Date Received : Nov 24, 2022
Date Reported : Dec 02, 2022
Report Number : 2447545-1

Page 3 of 3

Sample Number 22119548-3
Sampled Date Nov 23, 2022
Sample Description Air Quality
Location AT-4/AT-5
Date Analysis Commenced Nov 25, 2022
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Ethylbenzene	09:00 AM - 11:00 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 : Ronnachai Mougma

Remark :

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

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รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Stack	Total Hydrocarbon as Propane	Console Control Unit	BKK_FS0468	12-Jul-22	12-Jan-23	6
Stack	Total Hydrocarbon as Propane	Console Control Unit	BKK_FS0518	12-Jul-22	12-Jan-23	6
Stack	Total Hydrocarbon as Propane	Total Hydrocarbon Analyz	RYG_EN0038	14-Jan-22	14-Jan-23	12
Stack	Total Hydrocarbon as Propane	FID Analyzer	BKK_FS0758	1-Jul-22	1-Jan-23	6
Stack	Total Suspended Particulate	Console Control Unit	BKK_FS0468	12-Jul-22	12-Jan-23	6
Stack	Total Suspended Particulate	Console Control Unit	BKK_FS0518	12-Jul-22	12-Jan-23	6
Stack	Total Suspended Particulate	Digital Balance	RYG_EN0003	23-Mar-22	23-Mar-23	12
Stack (CEMs)	Oxides of Nitrogen	Analyzer , System calibrat	-	-	-	-
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0187	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0295	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	Digital Balance	RYG_EN0001	23-Mar-22	23-Mar-23	12
Ambient	Total Suspended Particulate	High Volume	RYG_FS0173	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_FS0396	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	RYG_EN0001	23-Mar-22	23-Mar-23	12
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0461	1-Jul-22	1-Jan-23	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0455	1-Jul-22	1-Jan-23	6
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direct	BKK_FS0141	7-Jun-21	6-Dec-22	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direct	RYG_FS0085	8-Oct-21	8-Apr-23	18
Workplace	Benzene	Field Rotameter	RYG_FS0199	1-Jul-22	1-Oct-22	3
Workplace	Benzene	Field Rotameter	RYG_FS0199	1-Oct-22	1-Jan-23	3
Workplace	Benzene	GC-MSD	BKK_EN0119	1-Oct-21	1-Apr-23	18
Workplace	Ethyl Benzene	Field Rotameter	RYG_FS0199	1-Jul-22	1-Oct-22	3
Workplace	Ethyl Benzene	Field Rotameter	RYG_FS0199	1-Oct-22	1-Jan-23	3
Workplace	Ethyl Benzene	GC-MSD	BKK_EN0119	1-Oct-21	1-Apr-23	18
Workplace	Styrene	Field Rotameter	RYG_FS0199	1-Jul-22	1-Oct-22	3
Workplace	Styrene	Field Rotameter	RYG_FS0199	1-Oct-22	1-Jan-23	3
Workplace	Styrene	GC-MSD	BKK_EN0119	1-Oct-21	1-Apr-23	18
Noise	Leq 24 hrs	Sound Calibrator	RYG_FS0496	10-Jan-22	10-Jan-23	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0018	4-Oct-21	4-Oct-22	12
Noise	Leq 8 hrs	Sound Calibrator	RYG_FS0496	10-Jan-22	10-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0024	4-Oct-21	4-Oct-22	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0015	24-May-22	24-May-23	12
Noise	Leq 8 hrs	Sound Calibrator	RYG_FS0213	26-Apr-22	26-Apr-23	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0023	10-Jan-22	10-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0022	21-Jan-22	21-Jan-23	12
Rayong Lab	pH at 25 °C	pH meter	RYG_EN0183	17-Mar-22	17-Mar-23	12
Rayong Lab	BOD	DO meter with Sensor	RYG_EN0032	14-Feb-22	15-Aug-23	18
Rayong Lab	BOD	Incubator	RYG_EN0154	22-Apr-22	21-Oct-23	18
Rayong Lab	COD	Spectrophotometer	RYG_EN0037	27-Sep-22	27-Mar-24	18
Rayong Lab	Total Suspended Solids	Electronic Balance	RYG_EN0002	23-Mar-22	23-Mar-23	12
Rayong Lab	Total Suspended Solids	Hot Air Oven	RYG_EN0010	20-Oct-22	20-Apr-24	18
Rayong Lab	Oil & Grease	Electronic Balance	RYG_EN0002	23-Mar-22	23-Mar-23	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
Rayong Lab	Temperature	pH Meter	RYG_FS0420	14-Mar-22	14-Mar-23	12
Rayong Lab	Color (at Original pH)	Spectrophotometer	RYG_EN0037	27-Sep-22	27-Mar-24	18
Rayong Lab	Color (at pH 7.0)	Spectrophotometer	RYG_EN0037	27-Sep-22	27-Mar-24	18
Water Lab	Benzene	Gas Chromatography (MS)	BKK_EN0059	21-Jun-22	21-Dec-23	18
Water Lab	Styrene	Gas Chromatography (MS)	BKK_EN0059	21-Jun-22	21-Dec-23	18



DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date : 12-Jul-22	Ambient Temperature (°C): 30
Calibration sheet No. : C-120722-BKK_FS0469	Relative Humidity (%): 70
Digital Temperature ID : BKK_FS0469	Reference Temperature ID : BKK_FS0609
Serial No. : 1302005	Serial No. : 7688004
Model : XC-572-V	Model : FLUKE 714
	Next Calibrate : 26 Jul 23

Location	Reference Temperature °C	Digital Temperature °C	Error °C	Remark
Stick	0	0	0	
	25	24	-1	
	50	49	-1	
	100	98	-2	
	150	148	-2	
	200	197	-3	
	250	247	-3	
	300	297	-3	
	400	497	-3	
	500	997	-3	
Probe	1000	1197	-3	
	1200	1197	-3	
	180	99	-1	
	125	124	-1	
Oven	150	149	-1	
	100	99	-1	
	125	124	-1	
	150	149	-1	
Filter	100	100	0	
	125	125	0	
	150	149	-1	
	180	149	-1	
Exit	0	0	0	
	10	11	1	
	20	21	1	
	30	31	1	
Meter	0	0	0	
	25	25	0	
	50	50	0	
	100	100	0	
AUX	0	0	0	
	25	25	0	
	50	50	0	
	100	100	0	

Calibrated by : Saksit Phaisanphisit

Approved by : Nattapol Jengwareewong
(Mr.Nattapol Jengwareewong)
Manager

Form 281-048 (02/04/03)



CONSOLE CONTROL UNIT CALIBRATION TEST REPORT

Calibration of Date : 12 Jul 22
Next Cal. Date : 12 Jan 23

Barometric Pressure (mm.Hg) : 755
Relative Humidity (%) : 70.0
Temperature (°C) : 30.0

Console Control Meter Data

Calibration No. : C-120722-BKK_FS0468
Dry Gas Meter No. : BKK_FS0468
Console Serial No. : 1302005
Console Model No. : XC-572-V

Reference Dry Gas Meter Data

Serial No. : 1607009
Model No. : SK25EXSR-QC6
Correction Factor (Yr) : 1.0060
Next Calibration Date : 7 Oct 22

ΔH (mm.H ₂ O)	Θ Minutes	Reference Dry Gas Meter Calibration				Console Control : Drygas Meter						Dry Gas Meter Correction Factor (Y)	Office Calibration Factor ΔH_{Θ}
		Vr (Liters)			Tr (°C)	Vm (Liters)			Ti (°C)	To (°C)	Avg.Tm (°C)		
		Final	Initial	Total		Final	Initial	Total					
15	12.80	150.00	0.00	150.00	31.0	344.0	191.0	153.00	30.0	30.0	30.0	0.9816	50.7881
25	9.60	150.00	0.00	150.00	31.0	511.4	358.0	153.40	30.0	30.0	30.0	0.9781	47.6138
50	6.68	150.00	0.00	150.00	31.0	673.4	520.0	153.40	31.0	31.0	31.0	0.9789	45.9560
100	4.62	150.00	0.00	150.00	32.0	842.0	689.0	153.00	31.0	31.0	31.0	0.9736	44.2543
150	3.77	150.00	0.00	150.00	32.0	1005.5	853.0	152.45	32.0	32.0	32.0	0.9756	44.0575
Avg.												0.9776	46.5339

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

ΔH_{Θ} : 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 Phaisanphisit
(Mr.Saksit Phaisanphisit)
Field Scientist (4)

Approved by : Nattapol Jengwareewong
(Mr.Nattapol Jengwareewong)
Field Specialist(1)

Rev. No. 01/2011-23 (13/01/23)



Pitot Tube Calibration Data

Pitot Tube Identification Number : BKK_FS0473 Calibration Date : 12 Jul 22
Lab test duct Number : 258-1-13-01 Standard Pitot ID : BKK_FS0441
Calibration Sheet No. : C-120722-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	16.60	0.842	-
	B	12.00	16.60	-	0.842
Test 2	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
Test 3	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
			$\overline{C_p}$	0.842	0.842

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

$$\left| \frac{C_p(A) - C_p(B)}{C_p(A) + C_p(B)} \right| \text{ must } BE \leq 0.01$$

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

Calibrated by

Saksit Phaisanphisit

Approved by

Nattapon Jengwarewong

(Mr.Saksit Phaisanphisit)

Field Scientist (4)

(Mr.Nattapol Jengwarewong)

Field Specialist(1)

Form 251-016 (01/03/02)



Pitot Tube Calibration Data

Pitot Tube Identification Number : BKK_FS0472 Calibration Date : 12 Jul 22
Lab test duct Number : 258-1-13-01 Standard Pitot ID : BKK_FS0441
Calibration Sheet No. : C-120722-BKK_FS0472 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	16.60	0.842	-
	B	12.00	16.60	-	0.842
Test 2	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
Test 3	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
			$\overline{C_p}$	0.842	0.842

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

$$\left| \frac{C_p(A) - C_p(B)}{C_p(A) + C_p(B)} \right| \text{ must } BE \leq 0.01$$

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

Calibrated by

Saksit Phaisanphisit

Approved by

Nattapon Jengwarewong

(Mr.Saksit Phaisanphisit)

Field Scientist (4)

(Mr.Nattapol Jengwarewong)

Field Specialist(1)

Form 251-016 (01/03/02)



CONSOLE CONTROL UNIT CALIBRATION TEST REPORT

Calibration of Date : 12 Jul 22
Next Cal. Date : 12 Jan 23

Barometric Pressure (mm.Hg) : 755
Relative Humidity (%) : 70.0
Temperature (°C) : 30.0

Console Control Meter Data

Calibration No. : C-120722-BKK_FS0518
Dry Gas Meter No. : BKK_FS0518
Console Serial No. : 1504025
Console Model No. : XC-572-V

Reference Dry Gas Meter Data

Serial No. : A2003240
Model No. : DGM-SK25RM-QS8
Correction Factor (Yr) : 1.0160
Next Calibration Date : 27 May 23

ΔH (mm.H ₂ O)	\ominus Minutes	Reference Dry Gas Meter Calibration				Console Control ; Drygas Meter						Dry Gas Meter Correction Factor (Y)	Office Calibration Factor $\Delta H@$
		Vr (Liters)			Tr (°C)	Vm (Liters)			Ti (°C)	To (°C)	Avg.Tm (°C)		
		Final	Initial	Total		Final	Initial	Total					
15	12.41	150.00	0.00	150.00	31.0	153838.0	153687.0	151.00	29.0	29.0	29.0	1.0012	47.8984
25	9.38	150.00	0.00	150.00	31.0	154002.0	153851.0	151.00	29.0	29.0	29.0	1.0002	45.6070
50	6.61	150.00	0.00	150.00	31.0	154164.0	154013.0	151.00	29.0	29.0	29.0	0.9978	45.2958
100	4.65	150.00	0.00	150.00	32.0	154330.0	154177.0	153.00	30.0	30.0	30.0	0.9800	44.9789
120	4.17	150.00	0.00	150.00	32.0	154616.0	154463.0	153.00	30.0	30.0	30.0	0.9781	43.4066
Avg.												0.9915	45.4374

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

$\Delta H@$: Onifice pressure differential that equates to 21.24 lm 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:

(Mr.Tinnakorn Kulchart)
Field Scientist (1)

Approved by:

(Mr.Nattaporn Jitwareewong)
Field Specialist(1)

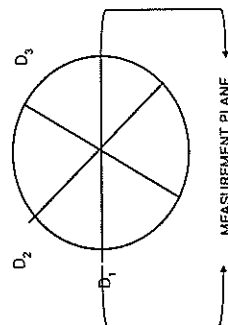
Form No. GS 281-23 (12/01/03)



PROBE NOZZLE DIAMETER CALIBRATION DATA SHEET

Calibration Date : 12 Jul 22
Calibration Sheet No. : C-120722-BKK_FS0474
Nozzle Set ID. : BKK_FS0474
Vernier Caliper ID. : BKK_FS0626

Nozzle ID #	Nozzle Diameter (cm.)				Hi - Lo ΔD	$(D_1 + D_2 + D_3) / 3$ D_{avg}
	D ₁	D ₂	D ₃	D _{avg}		
1	0.300	0.300	0.300	0.300	0.000	0.300
2	0.450	0.450	0.450	0.450	0.000	0.450
3	0.600	0.600	0.600	0.600	0.000	0.600
4	0.780	0.780	0.780	0.780	0.000	0.780
5	0.932	0.932	0.932	0.932	0.000	0.932
6	1.094	1.094	1.094	1.094	0.000	1.094
7	1.264	1.264	1.264	1.264	0.000	1.264



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

(Mr.Saksit Phaisanphisit)
Field Scientist (4)

Approved by

(Mr.Nattaporn Jitwareewong)
Field Specialist(1)

Form No. GS 281-023 (12/01/03)



DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date :	12-Jul-22	Ambient Temperature (°C) :	30
Calibration sheet No. :	C-120722-BKK_FS0519	Relative Humidity (%) :	70
Digital Temperature ID :	BKK_FS0519	Reference Temperature ID. :	BKK_FS1144
Console Serial No. :	1504025	Serial No. :	201090005013
Console Model :	XC-572-V	Model :	Digicon-CC-VT-MS
Next Calibrate :		31 Jan 23	

Location	Reference Temperature °C	Digital Temperature °C	Error °C	Remark
Stack	0	0	0	
	25	25	0	
	50	50	0	
	100	101	1	
	150	153	3	
	200	202	2	
	250	252	2	
	300	302	2	
	500	503	3	
	1000	1004	4	
Probe	1200	1205	5	
	100	101	1	
	125	127	2	
	150	153	3	
	100	101	1	
Oven	125	127	2	
	150	153	3	
	100	101	1	
	125	127	2	
	150	153	3	
Filter	100	101	1	
	125	127	2	
	150	153	3	
	0	0	0	
	10	9	-1	
Exit	20	19	-1	
	0	0	0	
	25	24	-1	
	50	50	0	
	0	0	0	
Meter	25	25	0	
	50	50	0	
AUX	25	25	0	
	50	50	0	

Calibrated by	_____	Approved by	_____
	(Mr. Tinnakorn Kulchart)		(Mr. Nathapol Jengwarewong)
	Field Scientist (1)		Field Specialist(1)



Pitot Tube Calibration Data

Pitot Tube Identification Number :	BKK_FS0522	Calibration Date :	12 Jul 22
Lab test duct Number :	258-1-13-01	Standard Pitot ID :	BKK_FS0441
Calibration Sheet No. :	C-120722-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	16.60	0.842	-
	B	12.00	16.60	-	0.842
Test 2	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
Test 3	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
			C _p	0.842	0.842

$$C_p(S) = C_{p_{std}} \sqrt{\frac{\Delta P_{std}}{\Delta P(S)}}$$
$$\left| \frac{C_{p(A)} - C_{p(B)}}{C_{p(A)} + C_{p(B)}} \right| \text{ must } BE \leq 0.01$$
$$\text{Average deviation(A or B)} = \frac{\sum [C_p(s) - C_{p(A \text{ or } B)}]}{3} \text{ must } BE \leq 0.01$$

Calibrated by	_____	Approved by	_____
	(Mr. Tinnakorn Kulchart)		(Mr. Nathapol Jengwarewong)
	Field Scientist (1)		Field Specialist(1)



Pitot Tube Calibration Data

Pitot Tube Identification Number : BKK_FS0523 Calibration Date : 12 Jul 22
 Lab test duct Number : 258-1-13-01 Standard Pitot ID : BKK_FS0441
 Calibration Sheet No. : C-120722-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	16.60	0.842	-
	B	12.00	16.60	-	0.842
Test 2	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
Test 3	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
			\bar{C}_p	0.842	0.842

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

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

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

Calibrated by : Can Approved by : Nattapon Jangwong
 (Mr.Jinnakom Kulchar) (Mr.Nattapol Jengwareewong)
 Field Scientist (1) Field Specialist(1)

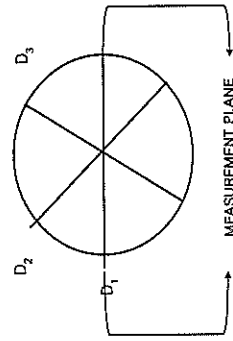
Form 281-046 (04/03/02)



PROBE NOZZLE DIAMETER CALIBRATION DATA SHEET

Calibration Date 12 Jul 22 Nozzle Set ID. : BKK_FS0524
 Calibration Sheet No. : C-120722-BKK_FS0524 Vernier Caliper ID. : BKK_FS0626

Nozzle ID #	Nozzle Diameter (mm.)			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	0.475	0.475	0.475	0.000	0.475
3	0.635	0.635	0.635	0.000	0.635
4	0.792	0.792	0.792	0.000	0.792
5	0.952	0.952	0.952	0.000	0.952
6	1.110	1.110	1.110	0.000	1.110
7	1.270	1.270	1.270	0.000	1.270



Where :

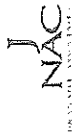
D_1, D_2, D_3 = Three different nozzle diameters at 60 degrees to each other, each measured the nearest 0.025 mm.

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

D_{avg} = $(D_1 + D_2 + D_3) / 3$

Calibrated by : Can Approved by : Nattapon Jangwong
 (Mr.Jinnakom Kulchar) (Mr.Nattapol Jengwareewong)
 Field Scientist (1) Field Specialist(1)

Form No. 02 281-026 (13/01/03)

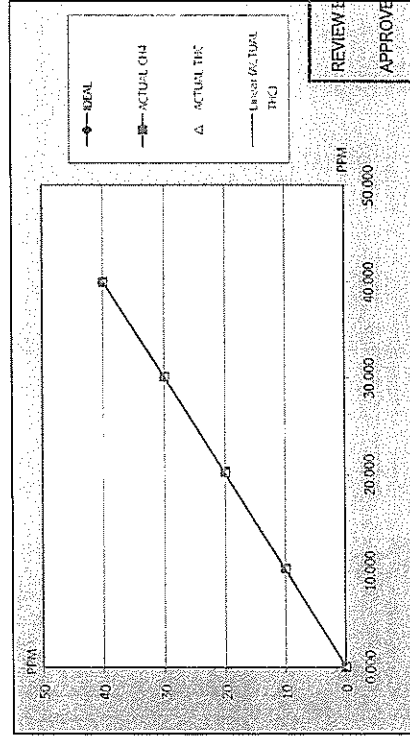


TEST REPORT

CUSTOMER NAME	ALS Laboratory Group (Thailand) Co., Ltd. บริษัท เอลลาบ แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด				
EQUIPMENT NAME	THC Analyzer	MODEL	APHA-370	SERIAL NO	U430GTHB
MANUFACTURER	HORIBA	STANDARD GAS CONCENTRATION (PPM)	506.1 PPM	CYLINDER NO	CCT34373
CYLINDER PRESSURE (psig)	1,600 PSI	CERTIFIED DATE	12/05/2020	EXPIRED DATE	12/05/2028
CERTIFIED BY	AIRGAS				

TEST RESULTS

POINT NO	TEST RESULTS					
	IDEAL	ACTUAL CH4	ERROR CH4	%ERROR CH4	ACTUAL THC	ERROR THC
ZERO	0.000	0.000	0.000	0.000	0.000	0.000
1	10.000	10.240	0.240	2.40	10.210	0.210
2	20.000	20.230	0.230	1.15	20.200	0.200
3	30.000	30.120	0.120	0.40	30.170	0.170
4	40.000	40.000	0.000	0.00	40.000	0.000
AVERAGE (%)				0.99		0.92



REVIEW BY : Thanthai
 APPROVED BY : D
 NEXT CAL DATE : 14/1/2023

CALIBRATED BY : วิภาวดี คังคังเจริญ DATE : 4/1/65
 CHECKED BY : วิภาวดี คังคังเจริญ DATE : 14/1/65

หลังจากข้อมูลงานผ่านเกณฑ์เรียบร้อยแล้ว : เจ้าหน้าที่ปฏิบัติงานบริการงาน โทร 02-868-0812 # 15,16, E-Mail : Engineer@jranatee.com
 เลขที่ 63/14-15,6/25-36 ถนนพหลโยธิน 17/1 แขวงจตุจักร เขตจตุจักร กรุงเทพมหานคร 10600 โทร 02-868-0812-13 โทรสาร 02-868-1889

CHECK LIST

CUSTOMER NAME	ALS Laboratory Group (Thailand) Co., Ltd. บริษัท เอลลาบ แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด		
EQUIPMENT NAME	THC Analyzer		
MANUFACTURER	HORIBA	MODEL	APHA-370
SERIAL NO.	U430GTHB		

TEST VALUES			
NO.	THC Analyzer (APHA - 370)	UNIT	
1	Signal (CH4)	mV	BEFORE 29.500 AFTER 51.300
2	Signal (THC)	mV	BEFORE 39.200 AFTER 56.500
3	Detector	Temp °C, Standard Value : Ambient temp+15°C to 15°C	BEFORE 47.300 AFTER 47.400
4	Ambient	Pressure kPa, Standard Value : (Ambient/101.3x100-20)-dPa	BEFORE 81.900 AFTER 81.800
5	Purifier	kPa current atmospheric pressure	BEFORE 101.500 AFTER 101.400
6	NIMHC	°C, Standard Value : 300 °C to 430 °C	BEFORE 420.200 AFTER 420.200
7	DC 24 V	kPa, Normal value : 5 kPa to 25 kPa	BEFORE 10.700 AFTER 10.300
8	DC 5 V	°C, Standard Value : 230 °C to 260 °C	BEFORE 243.000 AFTER 243.200
9	Bypass (Optional)	V, Standard Value : 24 V ± 0.5 V	BEFORE 23.900 AFTER 23.900
10	Over Flow (Optional)	V, Standard Value : 5 V ± 0.5 V	BEFORE 5.000 AFTER 5.000
11	CH4 Sampling Reading	L/min, Normal value : 0.9 L/min ± 0.3 L/min	BEFORE - AFTER -
12	NIMHC Sampling Reading	L/min, Standard Value : 0.8 L/min or More	BEFORE - AFTER -
13	THC Sampling Reading	PPM	BEFORE 2.900 AFTER 3.680
14	Zero Gas CH4/THC	PPM	BEFORE 0.720 AFTER 0.230
15	Span Gas	PPM	BEFORE 3.620 AFTER 3.730
16	Gas H2	PPM	BEFORE 0.27/0.32 AFTER 0.00/0.00
17	Gas H2	PPM	BEFORE 37.80/37.85 AFTER 40.0/40.0
18	Gas H2	20 PPM	BEFORE - AFTER -

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
 - ตรวจสอบการดำเนินงาน

ผลการดำเนินงาน
 - เก็บข้อมูล หรือผลการดำเนินงานตรวจวัดได้ตามปกติ

CALIBRATED BY : วิภาวดี คังคังเจริญ DATE : 14/1/65
 CHECKED BY : วิภาวดี คังคังเจริญ DATE : 14/1/65

หลังจากข้อมูลงานผ่านเกณฑ์เรียบร้อยแล้ว : เจ้าหน้าที่ปฏิบัติงานบริการงาน โทร 02-868-0812 # 15,16, E-Mail : Engineer@jranatee.com
 เลขที่ 63/14-15,6/25-36 ถนนพหลโยธิน 17/1 แขวงจตุจักร เขตจตุจักร กรุงเทพมหานคร 10600 โทร 02-868-0812-13 โทรสาร 02-868-1889

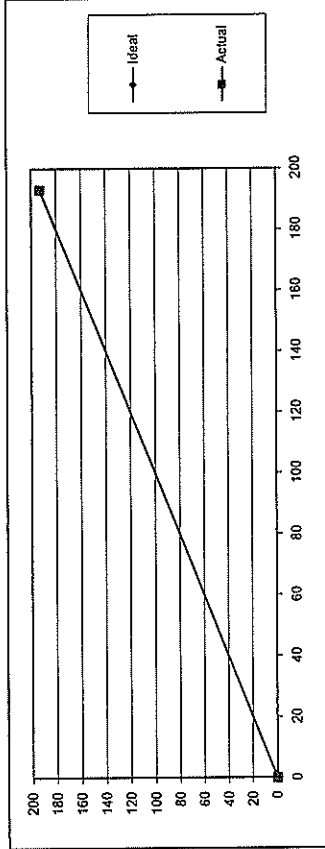


CALIBRATION REPORT

Calibration Date	1-Jul-22	Equipment ID	BKK_FS0758
Equipment Name	FID Analyzer	Manufacturer	Baseline Mocon
Model	9000H	Serial No.	0315EF0047
Std Gas Conc.(ppm)	193	Cylinder No.	D619622
Certified Date	17-Sep-14	Expired Date	17-Sep-22

CALIBRATION RESULTS

Point	CALIBRATION RESULTS		
	Ideal	Actual	Error
ZERO	0.00	0.04	0.04
SPAN	193.00	192.75	-0.25
AVERAGE (%)			-0.04



Calibrated By

Signature

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

Approved By

Signature

(Mr. Sarayuth Jitranont)
Assistant General Manager

ALS Laboratory Group



PENTA
CALIBRATION

PENTA CALIBRATION CO., LTD.
66/124 The Connect 33 Village Kanchanaphisek Road
Dokmai Prawat Bangkok 10250
Tel: +66 (0) 2069-9773
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Certificate of Calibration

Represent to Certificate of Calibration ,PTC07/22099

Certificate No.: PTC07/22099 Page: 1 of 2
Equipment: Digital Balance Condition: Normal
Manufacturer: Sartorius Serial No: 31709552
Model: MSU224S-100-DU ID No: RYG_EN0003
Type of Balance: Single Interval

Customer: ALS Laboratory Group (Thailand) Co.,Ltd.
616/10 Moo 5 T.Maenamkoo, A.Pluakdaeng,
Rayong 21140, Thailand

Environment Condition: Temperature 23.9 °C ± 0.3 °C
Humidity 58.1 %RH ± 4.4 %RH
Air density 1.17 kg/m³

Calibration Place: ALS Laboratory Group (Thailand) Co.,Ltd.
616/10 Moo 5 T.Maenamkoo, A.Pluakdaeng,
Rayong 21140, Thailand

The Method used: In house method, PTC-WI-07, base on Euramet cg. 18
Traceability: This certificate is traceable to the SI Units through Thai Calibration Service Co.,Ltd.
. NSC-ONSC Accreditation No.: Calibration 0189

Date Received: March 23, 2022
Calibration Date: March 23, 2022
Issued Date: March 25, 2022
Calibration By: Mr. Rungroje Melakul



PENTA CALIBRATION CO. LTD.

Signature
(Mr. Kiangsak Kalasi)
Reviewed by

Signature
Approved By :

(Mr. Keattisak Kerdito)
Laboratory Manager

This certificate is issued to the units of measurement according to the International System of Units (SI). It provides traceability of measurement to international or national standard or other recognised national standard laboratories.

The measurement uncertainty stated in the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to the Expression of Uncertainty in Measurement (GUM). The effect that the results relate only to the items calibrated.

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Certificate No.: PTC07/22099

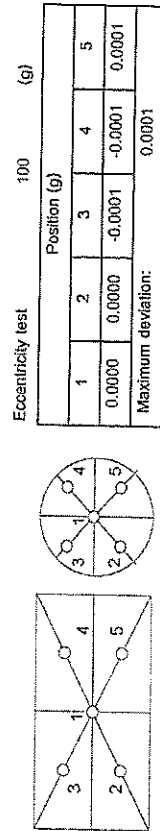
Page: 2 of 2

Measurement Results:

Without Adjustment :

Function Calibration: Non Adjustment

Eccentric Error: Weight to be 1/3, 1/2 or of Maximum capacity



Repeatability Test : Weight to be $1/2 \leq L_1 \leq$ Maximum capacity

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

Nominal test value (g)	Standard Deviation
200	0.00007

Error of indication : from nominal value., Readability 0.0001 (g)

Nominal Value (g)	Conventional Mass (g)	Indication (g)	Correction of Balance (g)	Uncertainty (g)	k
0	0.00000	0.0000	0.0000	0.00020	2.65
0.01	0.01000	0.0099	0.0001	0.00020	2.43
0.1	0.10000	0.1000	0.0000	0.00020	2.43
0.5	0.50000	0.5000	0.0000	0.00020	2.43
1	1.00000	1.0000	0.0000	0.00020	2.43
5	5.00001	5.0000	0.0000	0.00020	2.43
10	10.00000	10.0000	0.0000	0.00020	2.43
20	20.00003	20.0000	0.0000	0.00020	2.43
50	50.00004	50.0000	0.0000	0.00021	2.32
100	100.00004	99.9999	0.0001	0.00022	2.17
200	200.00011	200.0000	0.0001	0.00027	2.05

Note: Weight of adjust

(g)

The End of Certificate



ANALYZER CALIBRATION DATA

Client : Siam Styrene Monomer Co., Ltd. Location : Reactor Feed Heater (AF-7)
Date : 26 Oct 22 Test Operator : Sathaporn 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	0.00	0.02	0.08
Low-Level Gas	8.04	8.05	8.06	0.04
Span Gas	16.00	16.00	16.02	0.08

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	0.00	0.04	0.04
Low-Level Gas	54.96	54.94	54.94	0.00
Span Gas	79.42	79.42	79.40	0.02

CO ANALYZER : Model : TELEDYNE API 300EH 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	0.00	0.01	0.01
Low-Level Gas	54.84	54.82	54.81	0.01
Span Gas	80.16	80.16	80.14	0.02

Calibrated by

Sathaporn Th.

(Mr. Sathaporn Thakasaw)
Environmental Field Scientist (3)

FORM NO.: F-06-032 REVISION NO.: 2 ISSUE DATE: 30/01/19
ALS Laboratory Group



SYSTEM CALIBRATION BIAS AND DRIFT DATA

Lot No. 2229820-1

Client : Siam Styrene Monomer Co., Ltd. Location : Reactor Feed Header (AF-7)
Date : 26 Oct 22 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	0.00	0.01	0.04	0.02	0.08	0.04
Upscale Gas	16.00	16.02	0.08	16.02	0.08	0.00

NO_x ANALYZER
Cylinder Conc. (ppm) : 79.42 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	0.00	0.03	0.03	0.04	0.04	0.01
Upscale Gas	79.42	79.41	0.01	79.40	0.02	0.01

CO ANALYZER
Cylinder Conc. (ppm) : 80.16 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	0.00	0.01	0.01	0.01	0.01	0.00
Upscale Gas	80.16	80.14	0.02	80.14	0.02	0.00

Calibrated by

Sathaporn Th.

(Mr. Sathaporn Thakaeuw)

Environmental Field Scientist (3)

FORM NO.: F 06-062 REVISION NO.: 2 ISSUE DATE: 306/19
ALS Laboratory Group



EMISSION TEST RESULT

Client : Siam Styrene Monomer Co., Ltd. Run # : 1
Date : 26 Oct 22 Location : Reactor Feed Header (AF-7)
Start Time : 13:30 Test Operator : Sathaporn T.
Finish Time : 13:50
Serial No. : 735
Serial No. : 425

NO_x/O₂ Analyzer Model : TELEDYNE API 200EH
CO/CO₂ Analyzer Model : TELEDYNE API 300EM

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
13:30	5.21	8.68	25.38	-	0.53	
13:31	5.24	8.66	25.33	-	0.56	
13:32	5.36	8.63	25.62	-	0.53	
13:33	5.38	8.71	25.69	-	0.55	
13:34	5.29	8.60	25.58	-	0.59	
13:35	5.33	8.64	25.62	-	0.67	
13:36	5.33	8.68	25.65	-	0.72	
13:37	5.21	8.70	25.47	-	0.71	
13:38	5.26	8.65	25.34	-	0.67	
13:39	5.25	8.72	25.24	-	0.68	
13:40	5.30	8.61	25.31	-	0.71	
13:41	5.28	8.66	25.37	-	0.78	
13:42	5.24	8.72	25.51	-	0.66	
13:43	5.26	8.66	25.61	-	0.63	
13:44	5.23	8.69	25.68	-	0.63	
13:45	5.20	8.74	25.70	-	0.70	
13:46	5.22	8.71	25.77	-	0.75	
13:47	5.29	8.66	25.60	-	0.77	
13:48	5.31	8.69	25.56	-	0.78	
13:49	5.37	8.58	25.99	-	0.70	
13:50	5.38	8.70	25.95	-	0.70	
Average	5.29	8.68	25.60	-	0.67	

Sathaporn Th.

(Mr. Sathaporn Thakaeuw)

Environmental Field Scientist (3)

FORM NO.: F 06-062 REVISION NO.: 2 ISSUE DATE: 306/19
ALS Laboratory Group



EMISSION TEST RESULT

Client	Slam Styrene Monomer Co., Ltd.		Run #	3
	26 Oct 22		Location	Reactor Feed Heater (AF-7)
Start Time	14:12		Test Operator	Sathaporn T.
	TELEDYNE API 200EH		Finish Time	14:32
NO _x /O ₂ Analyzer Model	TELEDYNE API 300EM		Serial No.	735
			Serial No.	425

Time (min)	O ₂ (%)	CO ₂ (%)	NOx (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
14:12	5.28	8.62	25.64	-	0.84	
14:13	5.27	8.68	25.30	-	0.93	
14:14	5.27	8.63	25.45	-	0.94	
14:15	5.31	8.64	25.75	-	0.99	
14:16	5.33	8.71	25.97	-	0.94	
14:17	5.32	8.65	26.06	-	0.98	
14:18	5.31	8.53	25.91	-	1.02	
14:19	5.31	8.70	25.79	-	0.97	
14:20	5.28	8.65	25.89	-	0.99	
14:21	5.32	8.64	25.53	-	0.96	
14:22	5.28	8.67	25.61	-	0.98	
14:23	5.31	8.57	25.75	-	1.00	
14:24	5.32	8.65	25.62	-	0.96	
14:25	5.27	8.67	25.59	-	1.00	
14:26	5.21	8.63	25.59	-	0.95	
14:27	5.23	8.70	25.51	-	0.98	
14:28	5.25	8.73	25.50	-	1.03	
14:29	5.15	8.80	25.29	-	0.97	
14:30	5.21	8.77	25.04	-	0.99	
14:31	5.22	8.62	25.07	-	1.01	
14:32	5.23	8.72	25.24	-	1.06	
Average	5.27	8.66	25.57	-	0.98	

Sathaporn Th.

(Mr. Sathaporn Thakasaw)

Environmental Field Scientist (3)



EMISSION TEST RESULT

Client	Slam Styrene Monomer Co., Ltd.		Run #	2
	26 Oct 22		Location	Reactor Feed Heater (AF-7)
Start Time	13:51		Test Operator	Sathaporn T.
	TELEDYNE API 200EH		Finish Time	14:11
NO _x /O ₂ Analyzer Model	TELEDYNE API 300EM		Serial No.	735
			Serial No.	425

Time (min)	O ₂ (%)	CO ₂ (%)	NOx (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
13:51	5.28	8.66	25.76	-	0.72	
13:52	5.34	8.62	25.65	-	0.81	
13:53	5.27	8.61	25.78	-	0.81	
13:54	5.23	8.67	25.81	-	0.89	
13:55	5.23	8.70	25.60	-	0.78	
13:56	5.23	8.73	25.37	-	0.80	
13:57	5.28	8.57	25.27	-	0.76	
13:58	5.26	8.55	25.41	-	0.77	
13:59	5.32	8.65	25.64	-	0.81	
14:00	5.30	8.67	25.68	-	0.83	
14:01	5.27	8.64	25.54	-	0.79	
14:02	5.27	8.64	25.28	-	0.76	
14:03	5.26	8.70	25.23	-	0.83	
14:04	5.23	8.69	25.47	-	0.77	
14:05	5.28	8.78	25.62	-	0.77	
14:06	5.25	8.65	25.70	-	0.77	
14:07	5.20	8.71	25.54	-	0.80	
14:08	5.25	8.68	25.53	-	0.75	
14:09	5.23	8.57	25.78	-	0.85	
14:10	5.23	8.62	26.00	-	0.87	
14:11	5.26	8.67	25.93	-	0.86	
Average	5.27	8.65	25.60	-	0.79	

Sathaporn Th.

(Mr. Sathaporn Thakasaw)

Environmental Field Scientist (3)



ANALYZER CALIBRATION DATA

Lot No. 2229820-1

Client : Siam Styrene Monomer Co., Ltd. Location : Reactor Feed/Heater (AF-7)
Date : 26 Oct 22 Test Operator : Sathaporn 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	0.00	0.02	0.08
Low-Level Gas	8.04	8.05	8.06	0.04
Span Gas	16.00	16.00	16.02	0.08

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	0.00	0.04	0.04
Low-Level Gas	54.96	54.94	54.94	0.00
Span Gas	79.42	79.42	79.40	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	0.00	0.01	0.01
Low-Level Gas	54.84	54.82	54.81	0.01
Span Gas	80.16	80.16	80.14	0.02

Calibrated by

Sathaporn Th.

(Mr. Sathaporn Thakaew)

Environmental Field Scientist (3)

FORM NO.: F-06-104 REVISION NO.: - ISSUE DATE: 306/19
ALS Laboratory Group



SYSTEM CALIBRATION BIAS AND DRIFT DATA

Lot No. 2229820-1

Client : Siam Styrene Monomer Co., Ltd. Location : Reactor Feed/Heater (AF-7)
Date : 26 Oct 22 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	0.00	0.01	0.04	0.02	0.08	0.04
Upscale Gas	16.00	16.02	0.08	16.02	0.08	0.00

NO_x ANALYZER
Cylinder Conc. (ppm) : 79.42 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	0.00	0.03	0.03	0.04	0.04	0.01
Upscale Gas	79.42	79.41	0.01	79.40	0.02	0.01

CO ANALYZER
Cylinder Conc. (ppm) : 80.16 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	0.00	0.01	0.01	0.01	0.01	0.00
Upscale Gas	80.16	80.14	0.02	80.14	0.02	0.00

Calibrated by

Sathaporn Th.

(Mr. Sathaporn Thakaew)

Environmental Field Scientist (3)

FORM NO.: F-06-104 REVISION NO.: - ISSUE DATE: 306/19
ALS Laboratory Group



CEMS Data

Client Name Siam Syntex Monomer Co. Ltd
Plant Name Map Ta Phu, EBSM (SSMCO)
Date 26 Oct 22
Location Reactor FeedHeater (AF-7)

Run No: 1										Time Base: 21 min									
Date	Time	SO2	NOx	CO	O2	CO2	SO2	NOx	CO	O2	CO2	Date	Time	SO2	NOx	CO	O2	CO2	SO2
26 Oct 22	13:30	-	-	-	-	-	27.50	2.55	4.95	-	-	26 Oct 22	13:51	-	27.50	2.55	4.95	-	-
26 Oct 22	13:31	-	27.15	0.58	5.02	-	27.47	0.57	5.03	-	-	26 Oct 22	13:52	-	27.47	0.57	5.03	-	-
26 Oct 22	13:32	-	27.73	0.59	5.17	-	27.70	0.59	5.09	-	-	26 Oct 22	13:53	-	27.70	0.59	5.09	-	-
26 Oct 22	13:33	-	27.52	0.62	5.11	-	27.41	0.59	5.16	-	-	26 Oct 22	13:54	-	27.41	0.59	5.16	-	-
26 Oct 22	13:34	-	27.59	0.61	4.98	-	27.53	0.65	5.43	-	-	26 Oct 22	13:55	-	27.53	0.65	5.43	-	-
26 Oct 22	13:35	-	27.59	0.56	5.08	-	27.37	0.56	5.07	-	-	26 Oct 22	13:56	-	27.37	0.56	5.07	-	-
26 Oct 22	13:36	-	27.74	0.57	4.98	-	27.53	0.62	5.05	-	-	26 Oct 22	13:57	-	27.53	0.62	5.05	-	-
26 Oct 22	13:37	-	27.77	0.55	4.94	-	27.14	0.54	5.12	-	-	26 Oct 22	13:58	-	27.14	0.54	5.12	-	-
26 Oct 22	13:38	-	27.71	0.55	4.94	-	27.14	0.54	5.12	-	-	26 Oct 22	13:59	-	27.14	0.54	5.12	-	-
26 Oct 22	13:39	-	27.71	0.55	4.94	-	27.14	0.54	5.12	-	-	26 Oct 22	14:00	-	27.14	0.54	5.12	-	-
26 Oct 22	13:40	-	27.71	0.55	4.94	-	27.14	0.54	5.12	-	-	26 Oct 22	14:01	-	27.14	0.54	5.12	-	-
26 Oct 22	13:41	-	27.71	0.55	4.94	-	27.14	0.54	5.12	-	-	26 Oct 22	14:02	-	27.14	0.54	5.12	-	-
26 Oct 22	13:42	-	27.71	0.55	4.94	-	27.14	0.54	5.12	-	-	26 Oct 22	14:03	-	27.14	0.54	5.12	-	-
26 Oct 22	13:43	-	27.71	0.55	4.94	-	27.14	0.54	5.12	-	-	26 Oct 22	14:04	-	27.14	0.54	5.12	-	-
26 Oct 22	13:44	-	27.71	0.55	4.94	-	27.14	0.54	5.12	-	-	26 Oct 22	14:05	-	27.14	0.54	5.12	-	-
26 Oct 22	13:45	-	27.71	0.55	4.94	-	27.14	0.54	5.12	-	-	26 Oct 22	14:06	-	27.14	0.54	5.12	-	-
26 Oct 22	13:46	-	27.71	0.55	4.94	-	27.14	0.54	5.12	-	-	26 Oct 22	14:07	-	27.14	0.54	5.12	-	-
26 Oct 22	13:47	-	27.71	0.55	4.94	-	27.14	0.54	5.12	-	-	26 Oct 22	14:08	-	27.14	0.54	5.12	-	-
26 Oct 22	13:48	-	27.71	0.55	4.94	-	27.14	0.54	5.12	-	-	26 Oct 22	14:09	-	27.14	0.54	5.12	-	-
26 Oct 22	13:49	-	27.71	0.55	4.94	-	27.14	0.54	5.12	-	-	26 Oct 22	14:10	-	27.14	0.54	5.12	-	-
26 Oct 22	13:50	-	27.71	0.55	4.94	-	27.14	0.54	5.12	-	-	26 Oct 22	14:11	-	27.14	0.54	5.12	-	-
Max	Avg	-	27.15	0.51	5.21	-	27.20	0.49	5.09	-	-	Max	Avg	-	27.20	0.49	5.09	-	-
		-	27.16	0.52	5.08	-	27.20	0.49	5.09	-	-			-	27.20	0.49	5.09	-	-
		-	27.16	0.52	5.08	-	27.20	0.49	5.09	-	-			-	27.20	0.49	5.09	-	-

Run No: 3										Time Base: 21 min									
Date	Time	SO2	NOx	CO	O2	CO2	SO2	NOx	CO	O2	CO2	Date	Time	SO2	NOx	CO	O2	CO2	SO2
26 Oct 22	14:12	-	25.14	0.42	5.05	-	25.54	0.52	4.97	-	-	26 Oct 22	14:33	-	25.54	0.52	4.97	-	-
26 Oct 22	14:13	-	24.60	0.45	5.25	-	25.51	0.50	5.06	-	-	26 Oct 22	14:34	-	25.51	0.50	5.06	-	-
26 Oct 22	14:14	-	24.60	0.45	5.25	-	25.51	0.50	5.06	-	-	26 Oct 22	14:35	-	25.51	0.50	5.06	-	-
26 Oct 22	14:15	-	24.75	0.39	5.17	-	25.28	0.50	4.99	-	-	26 Oct 22	14:36	-	25.28	0.50	4.99	-	-
26 Oct 22	14:16	-	24.29	0.40	5.15	-	25.07	0.52	5.05	-	-	26 Oct 22	14:37	-	25.07	0.52	5.05	-	-
26 Oct 22	14:17	-	24.41	0.35	5.09	-	25.19	0.52	5.04	-	-	26 Oct 22	14:38	-	25.19	0.52	5.04	-	-
26 Oct 22	14:18	-	24.41	0.35	5.09	-	25.19	0.52	5.04	-	-	26 Oct 22	14:39	-	25.19	0.52	5.04	-	-
26 Oct 22	14:19	-	24.10	0.42	5.20	-	25.01	0.52	5.02	-	-	26 Oct 22	14:40	-	25.01	0.52	5.02	-	-
26 Oct 22	14:20	-	24.48	0.39	5.16	-	25.02	0.50	5.16	-	-	26 Oct 22	14:41	-	25.02	0.50	5.16	-	-
26 Oct 22	14:21	-	24.41	0.42	5.08	-	25.02	0.50	5.16	-	-	26 Oct 22	14:42	-	25.02	0.50	5.16	-	-
26 Oct 22	14:22	-	24.60	0.40	5.17	-	25.20	0.53	5.05	-	-	26 Oct 22	14:43	-	25.20	0.53	5.05	-	-
26 Oct 22	14:23	-	24.71	0.39	5.07	-	25.20	0.57	5.10	-	-	26 Oct 22	14:44	-	25.20	0.57	5.10	-	-
26 Oct 22	14:24	-	24.86	0.43	5.08	-	25.81	0.57	5.04	-	-	26 Oct 22	14:45	-	25.81	0.57	5.04	-	-
26 Oct 22	14:25	-	24.86	0.43	4.98	-	25.83	0.66	5.09	-	-	26 Oct 22	14:46	-	25.83	0.66	5.09	-	-
26 Oct 22	14:26	-	24.86	0.43	4.98	-	25.83	0.66	5.09	-	-	26 Oct 22	14:47	-	25.83	0.66	5.09	-	-
26 Oct 22	14:27	-	24.86	0.43	4.98	-	25.83	0.66	5.09	-	-	26 Oct 22	14:48	-	25.83	0.66	5.09	-	-
26 Oct 22	14:28	-	24.86	0.43	4.98	-	25.83	0.66	5.09	-	-	26 Oct 22	14:49	-	25.83	0.66	5.09	-	-
26 Oct 22	14:29	-	24.79	0.51	5.02	-	25.79	0.58	5.05	-	-	26 Oct 22	14:50	-	25.79	0.58	5.05	-	-
26 Oct 22	14:30	-	25.59	0.45	5.01	-	27.18	0.58	5.18	-	-	26 Oct 22	14:51	-	27.18	0.58	5.18	-	-
26 Oct 22	14:31	-	25.66	0.45	5.04	-	27.29	0.59	5.19	-	-	26 Oct 22	14:52	-	27.29	0.59	5.19	-	-
26 Oct 22	14:32	-	25.76	0.50	4.97	-	27.15	0.54	5.21	-	-	26 Oct 22	14:53	-	27.15	0.54	5.21	-	-
26 Oct 22	14:33	-	25.97	0.50	4.94	-	27.37	0.58	5.20	-	-	26 Oct 22	14:54	-	27.37	0.58	5.20	-	-
Max	Avg	-	25.78	0.51	5.28	-	27.37	0.58	5.21	-	-	Max	Avg	-	27.37	0.58	5.21	-	-
		-	24.85	0.43	5.07	-	26.52	0.50	5.08	-	-			-	26.52	0.50	5.08	-	-

Run No: 5							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%
26 Oct 22	14:54	-	27.02	0.50	5.31	-	26 Oct 22	15:15	-	25.14	0.46	5.15	-
26 Oct 22	14:55	-	27.07	0.57	5.28	-	26 Oct 22	15:16	-	24.70	0.47	5.29	-
26 Oct 22	14:56	-	27.04	0.62	5.25	-	26 Oct 22	15:17	-	24.40	0.47	5.29	-
26 Oct 22	14:57	-	27.38	0.62	5.13	-	26 Oct 22	15:18	-	24.58	0.48	5.16	-
26 Oct 22	14:58	-	27.02	0.55	5.31	-	26 Oct 22	15:19	-	25.23	0.48	5.09	-
26 Oct 22	14:59	-	27.02	0.55	5.32	-	26 Oct 22	15:20	-	25.11	0.50	5.05	-
26 Oct 22	15:00	-	27.71	0.54	5.14	-	26 Oct 22	15:21	-	25.13	0.49	5.04	-
26 Oct 22	15:01	-	27.71	0.54	5.14	-	26 Oct 22	15:22	-	25.41	0.45	5.07	-
26 Oct 22	15:02	-	27.71	0.54	5.14	-	26 Oct 22	15:23	-	25.23	0.53	5.11	-
26 Oct 22	15:03	-	27.71	0.53	5.12	-	26 Oct 22	15:24	-	25.45	0.53	5.08	-
26 Oct 22	15:04	-	27.71	0.53	5.12	-	26 Oct 22	15:25	-	25.45	0.53	5.08	-
26 Oct 22	15:05	-	27.71	0.53	5.12	-	26 Oct 22	15:26	-	25.59	0.54	5.33	-
26 Oct 22	15:06	-	26.70	0.51	5.23	-	26 Oct 22	15:27	-	25.68	0.54	5.31	-
26 Oct 22	15:07	-	25.55	0.48	5.34	-	26 Oct 22	15:28	-	25.39	0.55	5.17	-
26 Oct 22	15:08	-	26.21	0.48	5.18	-	26 Oct 22	15:29	-	25.01	0.53	5.29	-
26 Oct 22	15:09	-	25.85	0.47	5.32	-	26 Oct 22	15:30	-	25.43	0.56	5.16	-
26 Oct 22	15:10	-	25.21	0.44	5.30	-	26 Oct 22	15:31	-	25.59	0.58	5.11	-
26 Oct 22	15:11	-	25.74	0.42	5.28	-	26 Oct 22	15:32	-	25.81	0.57	5.23	-
26 Oct 22	15:12	-	25.74	0.42	5.28	-	26 Oct 22	15:33	-	25.81	0.57	5.23	-
26 Oct 22	15:13	-	25.74	0.42	5.28	-	26 Oct 22	15:34	-	26.41	0.57	5.23	-
26 Oct 22	15:14	-	24.71	0.49	5.25	-	26 Oct 22	15:35	-	26.85	0.58	5.13	-
26 Oct 22	15:15	-	24.71	0.49	5.25	-	26 Oct 22	15:36	-	26.85	0.58	5.13	-
26 Oct 22	15:16	-	24.71	0.49	5.25	-	26 Oct 22	15:37	-	26.85	0.58	5.13	-
26 Oct 22	15:17	-	24.71	0.49	5.25	-	26 Oct 22	15:38	-	26.85	0.58	5.13	-
26 Oct 22	15:18	-	24.71	0.49	5.25	-	26 Oct 22	15:39	-	26.85	0.58	5.13	-
26 Oct 22	15:19	-	24.71	0.49	5.25	-	26 Oct 22	15:40	-	26.85	0.58	5.13	-
26 Oct 22	15:20	-	24.71	0.49	5.25	-	26 Oct 22	15:41	-	26.85	0.58	5.13	-
26 Oct 22	15:21	-	24.71	0.49	5.25	-	26 Oct 22	15:42	-	26.85	0.58	5.13	-
26 Oct 22	15:22	-	24.71	0.49	5.25	-	26 Oct 22	15:43	-	26.85	0.58	5.13	-
26 Oct 22	15:23	-	24.71	0.49	5.25	-	26 Oct 22	15:44	-	26.85	0.58	5.13	-
26 Oct 22	15:24	-	24.71	0.49	5.25	-	26 Oct 22	15:45	-	26.85	0.58	5.13	-
26 Oct 22	15:25	-	24.71	0.49	5.25	-	26 Oct 22	15:46	-	26.85	0.58	5.13	-
26 Oct 22	15:26	-	24.71	0.49	5.25	-	26 Oct 22	15:47	-	26.85	0.58	5.13	-
26 Oct 22	15:27	-	24.71	0.49	5.25	-	26 Oct 22	15:48	-	26.85	0.58	5.13	-
26 Oct 22	15:28	-	24.71	0.49	5.25	-	26 Oct 22	15:49	-	26.85	0.58	5.13	-
26 Oct 22	15:29	-	24.71	0.49	5.25	-	26 Oct 22	15:50	-	26.85	0.58	5.13	-
26 Oct 22	15:30	-	24.71	0.49	5.25	-	26 Oct 22	15:51	-	26.85	0.58	5.13	-
26 Oct 22	15:31	-	24.71	0.49	5.25	-	26 Oct 22	15:52	-	26.85	0.58	5.13	-
26 Oct 22	15:32	-	24.71	0.49	5.25	-	26 Oct 22	15:53	-	26.85	0.58	5.13	-
26 Oct 22	15:33	-	24.71	0.49	5.25	-	26 Oct 22	15:54	-	26.85	0.58	5.13	-
26 Oct 22	15:34	-	24.71	0.49	5.25	-	26 Oct 22	15:55	-	26.85	0.58	5.13	-
26 Oct 22	15:35	-	24.71	0.49	5.25	-	26 Oct 22	15:56	-	26.85	0.58	5.13	-
26 Oct 22	15:36	-	24.71	0.49	5.25	-	26 Oct 22	15:57	-	26.85	0.58	5.13	-
26 Oct 22	15:37	-	24.71	0.49	5.25	-	26 Oct 22	15:58	-	26.85	0.58	5.13	-
26 Oct 22	15:38	-	24.71	0.49	5.25	-	26 Oct 22	15:59	-	26.85	0.58	5.13	-
26 Oct 22	15:39	-	24.71	0.49	5.25	-	26 Oct 22	16:00	-	26.85	0.58	5.13	-
26 Oct 22	15:40	-	24.71	0.49	5.25	-	26 Oct 22	16:01	-	26.85	0.58	5.13	-
26 Oct 22	15:41	-	24.71	0.49	5.25	-	26 Oct 22	16:02	-	26.85	0.58	5.13	-
26 Oct 22	15:42	-	24.71	0.49	5.25	-	26 Oct 22	16:03	-	26.85	0.58	5.13	-
26 Oct 22	15:43	-	24.71	0.49	5.25	-	26 Oct 22	16:04	-	26.85	0.58	5.13	-
26 Oct 22	15:44	-	24.71	0.49	5.25	-	26 Oct 22	16:05	-	26.85	0.58	5.13	-
26 Oct 22	15:45	-	24.71	0.49	5.25	-	26 Oct 22	16:06	-	26.85	0.58	5.13	-
26 Oct 22	15:46	-	24.71	0.49	5.25	-	26 Oct 22	16:07	-	26.85	0.58	5.13	-
26 Oct 22	15:47	-	24.71	0.49	5.25	-	26 Oct 22	16:08	-	26.85	0.58	5.13	-
26 Oct 22	15:48	-	24.71	0.49	5.25	-	26 Oct 22	16:09	-	26.85	0.58	5.13	-
26 Oct 22	15:49	-	24.71	0.49	5.25	-	26 Oct 22	16:10	-	26.85	0.58	5.13	-
26 Oct 22	15:50	-	24.71	0.49	5.25	-	26 Oct 22	16:11	-	26.85	0.58	5.13	-
26 Oct 22	15:51	-	24.71	0.49	5.25	-	26 Oct 22	16:12	-	26.85	0.58	5.13	-
26 Oct 22	15:52	-	24.71	0.49	5.25	-	26 Oct 22	16:13	-	26.85	0.58	5.13	-
26 Oct 22	15:53	-	24.71	0.49	5.25	-	26 Oct 22	16:14	-	26.85	0.58	5.13	-
26 Oct 22	15:54	-	24.71	0.49	5.25	-	26 Oct 22	16:15	-	26.85	0.58	5.13	-
26 Oct 22	15:55	-	24.71	0.49	5.25	-	26 Oct 22	16:16	-	26.85	0.58	5.13	-
26 Oct 22	15:56	-	24.71	0.49	5.25	-	26 Oct 22	16:17	-	26.85	0.58	5.13	-
26 Oct 22	15:57	-	24.71	0.49	5.25	-	26 Oct 22	16:18	-	26.85	0.58	5.13	-
26 Oct 22	15:58	-	24.71	0.49	5.25	-	26 Oct 22	16:19	-	26.85	0.58	5.13	-
26 Oct 22	15:59	-	24.71	0.49	5.25	-	26 Oct 22	16:20	-	26.85	0.58	5.13	-
26 Oct 22	16:00	-	24.71	0.49	5.25	-	26 Oct 22	16:21	-	26.85	0.58	5.13	-
26 Oct 22	16:01	-	24.71	0.49	5.25	-	26 Oct 22	16:22	-	26.85	0.58	5.13	-
26 Oct 22	16:02	-	24.71	0.49	5.25	-	26 Oct 22	16:23	-	26.85	0.58	5.13	-
26 Oct 22	16:03	-	24.71	0.49	5.25	-	26 Oct 22	16:24	-	26.85	0.58	5.13	-
26 Oct 22	16:04	-	24.71	0.49	5.25	-	26 Oct 22	16:25	-	26.85	0.58	5.13	-
26 Oct 22	16:05	-	24.71	0.49	5.25	-	26 Oct 22	16:26	-	26.85	0.58	5.13	-
26 Oct 22	16:06	-	24.71	0.49	5.25	-	26 Oct 22	16:27	-	26.85	0.58	5.13	-
26 Oct 22	16:07	-	24.71	0.49	5.25	-	26 Oct 22	16:28	-	26.85	0.58	5.13	-
26 Oct 22	16:08	-	24.71	0.49	5.25	-	26 Oct 22	16:29	-	26.85	0.58	5.13	-
26 Oct 22	16:09	-	24.71	0.49	5.25	-	26 Oct 22	16:30	-	26.85	0.58	5.13	-
26 Oct 22	16:10	-	24.71	0.49	5.25	-	26 Oct 22	16:31	-	26.85	0.58	5.13	-
26 Oct 22	16:11	-	24.71	0.49	5.25	-	26 Oct 22	16:32	-	26.85	0.58	5.13	-
26 Oct 22	16:12	-	24.71	0.49	5.25	-	26 Oct 22	16:33	-	26.85	0.58	5.13	-
26 Oct 22	16:13	-	24.71	0.49	5.25	-	26 Oct 22	16:34	-	26.85	0.58	5.13	-
26 Oct 22	16:14	-	24.71	0.49	5.25	-	26 Oct 22	16:35	-	26.85	0.58	5.13	-
26 Oct 22	16:15	-	24.71	0.49	5.25	-	26 Oct 22	16:36	-	26.85	0.58	5.13	-
26 Oct 22	16:16	-	24.71	0.49	5.25	-	26 Oct 22	16:37	-	26.85	0.58	5.13	-
26 Oct 22	16:17	-	24.71	0.49	5.25	-	26 Oct 22	16:38	-	26.85	0.58	5.13	-
26 Oct 22	16:18	-	24.71	0.49	5.25	-	26 Oct 22	16:39	-	26.85	0.58	5.13	-
26 Oct 22	16:19	-	24.71	0.49	5.25	-	26 Oct 22	16:40	-	26.85	0.58	5.13	-
26 Oct 22	16:20	-	24.71	0.49	5.25	-	26 Oct 22	16:41	-	26.85	0.58	5.13	-
26 Oct 22	16:21	-	24.71	0.49	5.25	-	26 Oct 22	16:42	-	26.85	0.58	5.13	-
26 Oct 22	16:22	-	24.71	0.49	5.25	-	26 Oct 22	16:43	-	26.85	0.58	5.13	-
26 Oct 22	16:23	-	24.71	0.49	5.25	-	26 Oct 22	16:44	-	26.85	0.58	5.13	-
26 Oct 22	16:24	-	24.71	0.49	5.25	-	26 Oct 22	16:45	-	26.85	0.58	5.13	-
26 Oct 22	16:25	-	24.71	0.49	5.25	-	26 Oct 22	16:46	-	26.85	0.58	5.13	-
26 Oct 22	16:26	-	24.71	0.49	5.25	-	26 Oct 22	16:47	-	26.85	0.58	5.13	-
26 Oct 22	16:27	-	24.71	0.49	5.25	-	26 Oct 22	16:48	-	26.85	0.58	5.13	-
26 Oct 22	16:28	-	24.71	0.49	5.25	-	26 Oct 22	16:49	-	26.85	0.58	5.13	-
26 Oct 22	16:29	-	24.71	0.49	5.25	-	26 Oct 22	16:50	-	26.85	0.58	5.13	-
26 Oct 22	16:30	-	24.71	0.49	5.25	-	26 Oct 22	16:51	-	26.85	0.58	5.13	-
26 Oct 22	16:31	-	24.71	0.49	5.25	-	26 Oct 22	16:52	-	26.85	0.58	5.13	-
26 Oct 22	16:32	-	24.71	0.49	5.25	-	26 Oct 22	16:53	-	26.85	0.58	5.13	-
26 Oct 22	16:33	-	24.71	0.49	5.25	-	26 Oct 22	16:54	-	26.85	0.58	5.13	-
26 Oct 22	16:34	-	24.71	0.49									



Client Name _____

Siam Styrene Monomer Co., Ltd
Map Ta Phut, EBSM (SSMC)

Location

25 Oct 22
receptor FeedHeater

Reference Method Data



Siam Styrene Monomer Co., Ltd.
Map Ta Phut, EBSM (SSMC)

[illegible]

26 Oct 22
reacor FeedHaste

Run No. 1										Run No. 2									
Time Span: 24 hrs										Time Span: 24 hrs									
Date	Time	Age	NO ₃ -N	CO ₂	DO	DO ₂	DO ₁	DO ₀	DO ₀	Date	Time	Age	NO ₃ -N	CO ₂	DO	DO ₂	DO ₁	DO ₀	
			ppm	Vol%	ppm	ppm	ppm	ppm	Vol%				ppm	Vol%	ppm	ppm	ppm	Vol%	
26-04-22	13:30	-	25.38	0.54	5.21	8.65	8.65	8.65	8.65	26-04-22	13:51	-	25.76	0.79	5.79	8.48	8.48	8.48	
26-04-22	13:31	-	25.33	0.61	5.34	8.56	8.56	8.56	8.56	26-04-22	13:52	-	25.71	0.79	5.79	8.48	8.48		
26-04-22	13:32	-	25.52	0.58	5.58	8.63	8.63	8.63	8.63	26-04-22	13:53	-	25.78	0.89	5.77	8.41	8.41		
26-04-22	13:33	-	25.69	0.60	5.33	8.71	8.71	8.71	8.71	26-04-22	13:54	-	25.69	0.81	5.69	8.52	8.52		
26-04-22	13:34	-	25.67	0.71	5.33	8.84	8.84	8.84	8.84	26-04-22	13:55	-	25.69	0.81	5.69	8.52	8.52		
26-04-22	13:35	-	25.62	0.71	5.33	8.84	8.84	8.84	8.84	26-04-22	13:56	-	25.57	0.68	5.65	8.79	8.79		
26-04-22	13:36	-	25.65	0.79	5.33	8.68	8.68	8.68	8.68	26-04-22	13:57	-	25.27	0.63	5.29	8.57	8.57		
26-04-22	13:37	-	25.47	0.74	5.31	8.70	8.70	8.70	8.70	26-04-22	13:58	-	25.41	0.84	5.38	8.55	8.55		
26-04-22	13:38	-	25.34	0.73	5.31	8.65	8.65	8.65	8.65	26-04-22	13:59	-	25.64	0.88	5.32	8.55	8.55		
26-04-22	13:39	-	25.34	0.74	5.25	8.72	8.72	8.72	8.72	26-04-22	14:00	-	25.68	0.96	5.59	8.47	8.47		
26-04-22	13:40	-	25.31	0.78	5.39	8.81	8.81	8.81	8.81	26-04-22	14:01	-	25.64	0.84	5.64	8.57	8.57		
26-04-22	13:41	-	25.37	0.79	5.39	8.81	8.81	8.81	8.81	26-04-22	14:02	-	25.64	0.84	5.64	8.57	8.57		
26-04-22	13:42	-	25.37	0.79	5.39	8.81	8.81	8.81	8.81	26-04-22	14:03	-	25.25	0.81	5.56	8.70	8.70		
26-04-22	13:43	-	25.61	0.69	5.25	8.66	8.66	8.66	8.66	26-04-22	14:04	-	25.47	0.84	5.39	8.69	8.69		
26-04-22	13:44	-	25.68	0.69	5.29	8.69	8.69	8.69	8.69	26-04-22	14:05	-	25.67	0.84	5.38	8.78	8.78		
26-04-22	13:45	-	25.70	0.77	5.50	8.74	8.74	8.74	8.74	26-04-22	14:06	-	25.70	0.84	5.25	8.85	8.85		
26-04-22	13:46	-	25.77	0.82	5.22	8.71	8.71	8.71	8.71	26-04-22	14:07	-	25.54	0.88	5.20	8.71	8.71		
26-04-22	13:47	-	25.90	0.84	5.29	8.69	8.69	8.69	8.69	26-04-22	14:08	-	25.53	0.82	5.25	8.82	8.82		
26-04-22	13:48	-	25.98	0.85	5.31	8.59	8.59	8.59	8.59	26-04-22	14:09	-	25.53	0.82	5.25	8.82	8.82		
26-04-22	13:49	-	25.98	0.85	5.31	8.59	8.59	8.59	8.59	26-04-22	14:10	-	25.53	0.82	5.25	8.82	8.82		
26-04-22	13:50	-	25.95	0.77	5.38	8.70	8.70	8.70	8.70	26-04-22	14:11	-	25.69	0.95	5.39	8.62	8.62		
26-04-22	13:51	-	25.95	0.77	5.38	8.70	8.70	8.70	8.70	26-04-22	14:12	-	25.93	0.95	5.39	8.67	8.67		
Max			26.08	0.98	5.58	8.74	8.74	8.74	8.74	Max			26.09	0.98	5.58	8.78	8.78		
			26.05	0.73	5.29	8.66	8.66	8.66	8.66				25.95	0.97	5.37	8.55	8.55		

Run No.: 3	Time Base: 21 min						Run No.: 4	Time Base: 21 min						
	Date	Time	SQZ gpm	NOx ppm	CO ppm	CO2 Vol%		Date	Time	SQZ gpm	NOx ppm	CO ppm	CO2 Vol%	
	26 Oct 22	1412	-	25.64	9.91	5.38	8.62	26 Oct 22	1433	-	25.34	11.10	5.19	8.72
	26 Oct 22	1413	-	25.30	12.82	5.37	8.63	26 Oct 22	1434	-	25.32	11.11	5.18	8.66
	26 Oct 22	1414	-	25.45	12.88	5.31	8.63	26 Oct 22	1435	-	25.28	11.12	5.24	8.75
	26 Oct 22	1415	-	25.75	13.88	5.31	8.64	26 Oct 22	1436	-	25.35	11.13	5.22	8.75
	26 Oct 22	1416	-	25.66	14.88	5.32	8.65	26 Oct 22	1437	-	25.65	11.14	5.22	8.65
	26 Oct 22	1417	-	25.66	14.87	5.32	8.65	26 Oct 22	1438	-	25.65	11.11	5.17	8.74
	26 Oct 22	1418	-	25.69	14.87	5.31	8.53	26 Oct 22	1439	-	25.67	11.08	5.06	8.81
	26 Oct 22	1419	-	25.78	15.88	5.31	8.70	26 Oct 22	1440	-	25.73	12.88	5.11	8.66
	26 Oct 22	1420	-	25.88	16.88	5.28	8.65	26 Oct 22	1441	-	25.73	12.86	5.14	8.79
	26 Oct 22	1421	-	25.53	16.25	5.32	8.64	26 Oct 22	1442	-	25.82	13.08	5.10	8.52
	26 Oct 22	1422	-	25.61	15.98	5.38	8.67	26 Oct 22	1443	-	25.11	11.10	5.11	8.76
	26 Oct 22	1423	-	25.75	13.15	5.41	8.65	26 Oct 22	1444	-	25.54	11.10	5.11	8.76
	26 Oct 22	1424	-	25.59	11.96	5.37	8.65	26 Oct 22	1445	-	25.54	11.05	5.09	8.69
	26 Oct 22	1425	-	25.59	11.06	5.27	8.67	26 Oct 22	1446	-	25.53	11.08	5.12	8.79
	26 Oct 22	1426	-	25.69	16.84	5.21	8.63	26 Oct 22	1447	-	25.34	12.88	5.14	8.65
	26 Oct 22	1427	-	25.51	15.88	5.23	8.70	26 Oct 22	1448	-	25.38	12.89	5.13	8.70
	26 Oct 22	1428	-	25.65	13.13	5.25	8.73	26 Oct 22	1449	-	25.82	11.08	5.11	8.73
	26 Oct 22	1429	-	25.29	12.97	5.15	8.69	26 Oct 22	1450	-	25.82	12.87	5.13	8.70
	26 Oct 22	1430	-	25.64	12.89	5.21	8.77	26 Oct 22	1451	-	25.67	12.87	5.13	8.70
	26 Oct 22	1431	-	25.69	13.11	5.23	8.77	26 Oct 22	1452	-	25.49	13.11	5.22	8.66
	26 Oct 22	1432	-	25.26	11.16	5.21	8.81	26 Oct 22	1453	-	25.59	13.11	5.21	8.86
Max			-	25.88	16.16	5.27	8.69	Max		-	25.73	13.15	5.26	8.81
			-	25.66	13.17	5.21	8.66			-	25.58	13.09	5.16	8.71

Run No: 5		Time Base: 21 min									
Date	Time	SQZ	Wht	CO	CO2	CO	O2	CO2	CO	O2	CO2
		gpm	gpm	gpm	gpm	gpm	gpm	gpm	gpm	gpm	gpm
26-04-12	14:44	-	26.59	1.12	5.24	8.60	1.08	5.12	8.76	1.05	5.05
26-04-12	14:55	-	26.72	1.11	5.25	8.55	1.19	5.14	8.71	1.07	5.05
26-04-12	14:56	-	26.87	1.12	5.31	8.70	1.08	5.18	8.64	1.07	5.05
26-04-12	14:57	-	26.97	1.07	5.28	8.65	1.05	5.15	8.58	1.05	5.05
26-04-12	14:58	-	26.97	1.06	5.24	8.70	1.05	5.14	8.52	1.05	5.05
26-04-12	14:59	-	26.97	1.06	5.24	8.70	1.05	5.14	8.52	1.05	5.05
26-04-12	15:00	-	26.96	1.10	5.22	8.73	1.05	5.12	8.74	1.02	5.04
26-04-12	15:01	-	26.92	1.03	5.26	8.55	1.05	5.14	8.50	1.05	5.05
26-04-12	15:02	-	26.17	1.15	5.33	8.70	1.05	5.12	8.55	1.05	5.05
26-04-12	15:03	-	26.35	1.21	5.25	8.63	1.05	5.12	8.52	1.05	5.05
26-04-12	15:04	-	26.24	1.14	5.22	8.65	1.05	5.12	8.49	1.05	5.05
26-04-12	15:05	-	26.14	1.20	5.22	8.61	1.05	5.12	8.46	1.05	5.05
26-04-12	15:06	-	26.14	1.20	5.22	8.61	1.05	5.12	8.46	1.05	5.05
26-04-12	15:07	-	26.82	1.16	5.31	8.67	1.05	5.12	8.49	1.05	5.05
26-04-12	15:08	-	26.53	1.17	5.31	8.67	1.05	5.12	8.49	1.05	5.05
26-04-12	15:09	-	26.54	1.19	5.18	8.73	1.05	5.12	8.49	1.05	5.05
26-04-12	15:10	-	26.28	1.25	5.19	8.64	1.05	5.12	8.49	1.05	5.05
26-04-12	15:11	-	26.29	1.28	5.15	8.66	1.05	5.12	8.49	1.05	5.05
26-04-12	15:12	-	26.29	1.28	5.15	8.66	1.05	5.12	8.49	1.05	5.05
26-04-12	15:13	-	26.45	1.21	5.25	8.66	1.05	5.12	8.49	1.05	5.05
26-04-12	15:14	-	26.55	1.21	5.14	8.65	1.05	5.12	8.49	1.05	5.05
26-04-12	15:14	-	26.52	1.28	5.31	8.73	1.05	5.12	8.49	1.05	5.05
26-04-12	15:14	-	26.17	1.34	5.22	8.65	1.05	5.12	8.49	1.05	5.05

Run No: 6		Time Base: 21 min									
Date	Time	SQZ	Wht	CO	CO2	CO	O2	CO2	CO	O2	CO2
		gpm	gpm	gpm	gpm	gpm	gpm	gpm	gpm	gpm	gpm
26-04-12	15:15	-	26.56	1.19	5.14	8.76	1.19	5.12	8.76	1.19	5.12
26-04-12	15:16	-	26.34	1.27	5.18	8.71	1.19	5.12	8.76	1.19	5.12
26-04-12	15:17	-	26.28	1.22	5.11	8.71	1.19	5.12	8.76	1.19	5.12
26-04-12	15:18	-	26.61	1.14	5.21	8.75	1.19	5.12	8.76	1.19	5.12
26-04-12	15:19	-	26.61	1.14	5.21	8.75	1.19	5.12	8.76	1.19	5.12
26-04-12	15:20	-	26.61	1.20	5.12	8.74	1.19	5.12	8.76	1.19	5.12
26-04-12	15:21	-	26.64	1.24	5.04	8.50	1.19	5.12	8.76	1.19	5.12
26-04-12	15:22	-	26.64	1.16	4.59	8.60	1.19	5.12	8.76	1.19	5.12
26-04-12	15:23	-	26.81	1.19	4.89	8.52	1.19	4.87	8.59	1.19	4.89
26-04-12	15:24	-	26.46	1.25	4.81	8.64	1.25	4.81	8.64	1.25	4.81
26-04-12	15:25	-	26.43	1.25	4.79	8.63	1.25	4.79	8.63	1.25	4.79
26-04-12	15:26	-	26.53	1.23	4.80	8.58	1.23	4.80	8.58	1.23	4.80
26-04-12	15:29	-	26.44	1.21	4.89	8.63	1.21	4.89	8.63	1.21	4.89
26-04-12	15:31	-	26.44	1.25	4.89	8.61	1.25	4.89	8.61	1.25	4.89
26-04-12	15:32	-	26.46	1.25	4.85	8.55	1.25	4.85	8.55	1.25	4.85
26-04-12	15:33	-	26.46	1.25	4.85	8.55	1.25	4.85	8.55	1.25	4.85
26-04-12	15:34	-	27.24	1.15	4.47	8.51	1.15	4.47	8.51	1.15	4.47
26-04-12	15:34	-	27.47	1.18	4.47	8.47	1.18	4.47	8.47	1.18	4.47
26-04-12	15:35	-	27.57	1.29	4.69	8.57	1.29	4.69	8.57	1.29	4.69
26-04-12	15:35	-	27.57	1.29	4.69	8.57	1.29	4.69	8.57	1.29	4.69
26-04-12	15:35	-	27.52	1.29	4.51	8.54	1.29	4.51	8.54	1.29	4.51
26-04-12	15:36	-	26.82	1.31	4.61	8.53	1.31	4.61	8.53	1.31	4.61

Run No: 7										Time Base: 21 min									
Date	Time	SQZ	HQ	CO	QZ	CDZ	Date	Time	SQZ	HQ	CO	QZ	CDZ						
		point	point	point	W/L	W/L			point	point	point	W/L	W/L						
3-6-0-22	13:36	-	27:28	1:25	4.97	4.27	3-6-0-22	15:47	-	26:58	1:26	4.94	4.19						
3-6-0-22	13:39	-	27:28	1:25	4.97	4.27	3-6-0-22	15:50	-	26:58	1:26	4.94	4.19						
3-6-0-22	13:40	-	27:28	1:25	4.97	4.27	3-6-0-22	15:53	-	26:58	1:26	4.94	4.19						
3-6-0-22	13:43	-	27:45	1:25	4.94	4.24	3-6-0-22	15:56	-	26:40	1:26	4.91	4.16						
3-6-0-22	13:49	-	27:52	1:20	4.89	4.14	3-6-0-22	16:00	-	26:54	1:25	4.90	4.23						
3-6-0-22	15:41	-	27:52	1:20	4.89	4.14	3-6-0-22	16:03	-	26:42	1:45	4.92	4.18						
3-6-0-22	15:42	-	26:52	1:17	4.89	4.23	3-6-0-22	16:07	-	26:57	1:27	4.93	4.20						
3-6-0-22	15:43	-	26:46	1:28	4.93	4.16	3-6-0-22	16:10	-	26:57	1:27	4.93	4.20						
3-6-0-22	15:46	-	26:56	1:28	4.94	4.16	3-6-0-22	16:13	-	26:57	1:27	4.93	4.20						
3-6-0-22	15:48	-	26:56	1:31	4.94	4.20	3-6-0-22	16:25	-	25:35	1:37	5.15	4.31						
3-6-0-22	15:49	-	26:53	1:31	4.94	4.23	3-6-0-22	16:28	-	25:43	1:35	4.94	4.26						
3-6-0-22	15:47	-	26:68	1:38	4.56	4.12	3-6-0-22	16:57	-	25:68	1:31	5.04	4.24						
3-6-0-22	15:48	-	27:17	1:33	4.93	4.17	3-6-0-22	16:58	-	25:71	1:39	5.39	4.41						
3-6-0-22	15:49	-	27:27	1:31	4.93	4.19	3-6-0-22	16:59	-	25:81	1:36	5.47	4.35						
3-6-0-22	15:50	-	26:72	1:34	4.92	4.20	3-6-0-22	17:01	-	25:85	1:35	5.47	4.35						
3-6-0-22	15:51	-	26:72	1:34	4.92	4.20	3-6-0-22	17:04	-	25:85	1:35	5.47	4.35						
3-6-0-22	15:52	-	26:72	1:34	4.92	4.20	3-6-0-22	17:07	-	25:59	1:36	5.47	4.35						
3-6-0-22	15:53	-	26:63	1:31	4.91	4.21	3-6-0-22	17:10	-	25:54	1:32	5.46	4.35						
3-6-0-22	15:54	-	26:47	1:37	4.92	4.18	3-6-0-22	17:14	-	25:79	1:38	5.49	4.32						
3-6-0-22	15:55	-	26:45	1:38	4.90	4.19	3-6-0-22	17:16	-	25:84	1:38	5.53	4.26						
3-6-0-22	15:56	-	26:54	1:38	4.89	4.19	3-6-0-22	17:18	-	26:04	1:40	5.51	4.41						
3-6-0-22	15:58	-	26:54	1:38	4.89	4.19	3-6-0-22	17:17	-	25:92	1:38	5.45	4.39						
Max	Max	-	27:53	1:38	4.92	4.20	Max	Max	-	26:81	1:45	5.53	4.24						
Avg	Avg	-	26:57	1:38	4.92	4.19	Avg	Avg	-	26:07	1:36	5.28	4.38						

Run No: 9										Time Base: 21 min									
Date	Time	SOT perm	NOK perm	CO2 NOK	CO2 NOK	CO2 NOK	CO2 NOK	CO2 NOK	CO2 NOK	Date	Time	SOT perm	NOK perm	CO2 NOK	CO2 NOK	CO2 NOK	CO2 NOK	CO2 NOK	CO2 NOK
26 Oct 12	16:18	-	26:30	1.6	5.46	8.84	8.84	8.84	8.84	26 Oct 12	16:39	-	26:31	1.48	5.84	8.74	8.74	8.74	8.74
26 Oct 12	16:19	-	26:30	1.42	5.46	8.84	8.84	8.84	8.84	26 Oct 12	16:40	-	26:31	1.48	5.84	8.74	8.74	8.74	8.74
26 Oct 12	16:20	-	26:34	1.42	5.46	8.82	8.82	8.82	8.82	26 Oct 12	16:41	-	26:31	1.42	5.75	8.71	8.71	8.71	8.71
26 Oct 12	16:21	-	26:34	1.40	5.39	8.81	8.81	8.81	8.81	26 Oct 12	16:42	-	26:37	1.30	5.59	8.80	8.80	8.80	8.80
26 Oct 12	16:22	-	26:35	1.44	5.42	8.93	8.93	8.93	8.93	26 Oct 12	16:43	-	26:32	1.43	5.59	8.88	8.88	8.88	8.88
26 Oct 12	16:23	-	26:35	1.43	5.41	8.91	8.91	8.91	8.91	26 Oct 12	16:44	-	26:31	1.43	5.59	8.88	8.88	8.88	8.88
26 Oct 12	16:24	-	26:36	1.43	5.45	8.92	8.92	8.92	8.92	26 Oct 12	16:45	-	26:32	1.43	5.59	8.88	8.88	8.88	8.88
26 Oct 12	16:25	-	26:34	1.46	5.46	8.87	8.87	8.87	8.87	26 Oct 12	16:46	-	26:32	1.46	5.59	8.88	8.88	8.88	8.88
26 Oct 12	16:26	-	26:36	1.46	5.46	8.87	8.87	8.87	8.87	26 Oct 12	16:47	-	26:32	1.59	5.64	8.82	8.82	8.82	8.82
26 Oct 12	16:27	-	26:36	1.46	5.46	8.85	8.85	8.85	8.85	26 Oct 12	16:48	-	26:37	1.57	5.61	8.81	8.81	8.81	8.81
26 Oct 12	16:28	-	26:37	1.40	5.50	8.85	8.85	8.85	8.85	26 Oct 12	16:49	-	26:35	1.58	5.55	8.80	8.80	8.80	8.80
26 Oct 12	16:29	-	26:33	1.42	5.54	8.81	8.81	8.81	8.81	26 Oct 12	16:50	-	26:45	1.42	5.53	8.80	8.80	8.80	8.80
26 Oct 12	16:30	-	26:34	1.46	5.54	8.84	8.84	8.84	8.84	26 Oct 12	16:51	-	26:44	1.44	5.62	8.69	8.69	8.69	8.69
26 Oct 12	16:31	-	26:38	1.47	5.52	8.84	8.84	8.84	8.84	26 Oct 12	16:52	-	26:39	1.47	5.62	8.81	8.81	8.81	8.81
26 Oct 12	16:32	-	26:36	1.47	5.52	8.89	8.89	8.89	8.89	26 Oct 12	16:53	-	26:39	1.46	5.62	8.81	8.81	8.81	8.81
26 Oct 12	16:33	-	26:36	1.46	5.51	8.84	8.84	8.84	8.84	26 Oct 12	16:54	-	26:39	1.46	5.62	8.81	8.81	8.81	8.81
26 Oct 12	16:34	-	26:36	1.46	5.51	8.85	8.85	8.85	8.85	26 Oct 12	16:55	-	26:35	1.52	5.59	8.80	8.80	8.80	8.80
26 Oct 12	16:35	-	26:34	1.48	5.51	8.81	8.81	8.81	8.81	26 Oct 12	16:56	-	26:34	1.52	5.59	8.80	8.80	8.80	8.80
26 Oct 12	16:36	-	26:34	1.48	5.51	8.81	8.81	8.81	8.81	26 Oct 12	16:57	-	26:36	1.48	5.60	8.83	8.83	8.83	8.83
26 Oct 12	16:37	-	26:38	1.49	5.54	8.73	8.73	8.73	8.73	26 Oct 12	16:58	-	26:36	1.36	5.65	8.80	8.80	8.80	8.80
26 Oct 12	16:38	-	26:35	1.49	5.68	8.74	8.74	8.74	8.74	26 Oct 12	16:59	-	26:36	1.50	5.61	8.78	8.78	8.78	8.78
26 Oct 12	16:39	-	26:39	1.41	5.67	8.81	8.81	8.81	8.81	26 Oct 12	17:00	-	26:34	1.54	5.55	8.78	8.78	8.78	8.78
26 Oct 12	16:40	-	26:39	1.49	5.68	8.86	8.86	8.86	8.86	26 Oct 12	17:01	-	26:37	1.56	5.67	8.90	8.90	8.90	8.90
26 Oct 12	16:41	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:02	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:42	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:03	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:43	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:04	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:44	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:05	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:45	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:06	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:46	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:07	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:47	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:08	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:48	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:09	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:49	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:10	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:50	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:11	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:51	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:12	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:52	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:13	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:53	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:14	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:54	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:15	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:55	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:16	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:56	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:17	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:57	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:18	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:58	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:19	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	16:59	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:20	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:00	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:21	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:01	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:22	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:02	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:23	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:03	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:24	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:04	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:25	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:05	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:26	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:06	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:27	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:07	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:28	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:08	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:29	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:09	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:30	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:10	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:31	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:11	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:32	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:12	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:33	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:13	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:34	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:14	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:35	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:15	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:36	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:16	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:37	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:17	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:38	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:18	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:39	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:19	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:40	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:20	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:41	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:21	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:42	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:22	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:43	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12	17:23	-	26:38	1.45	5.61	8.83	8.83	8.83	8.83	26 Oct 12	17:44	-	26:38	1.48	5.62	8.92	8.92	8.92	8.92
26 Oct 12</																			

Time Base: 21 min															
Run No: 11		Run No: 12													
Date	Time	SQZ	MOZ	CO	O ₂	VO ₂	CO ₂	Date	Time	SQZ	MOZ	CO	O ₂	VO ₂	CO ₂
		feet	feet	feet	%	feet	%			feet	feet	feet	%	feet	%
26 Oct 22	17:00	-	26.87	1.49	5.60	8.78		26 Oct 22	17:21	-	26.87	1.56	5.55	8.78	
26 Oct 22	17:01	-	26.76	1.49	5.67	8.78		26 Oct 22	17:22	-	26.70	1.56	5.55	8.78	
26 Oct 22	17:02	-	26.87	1.49	5.67	8.78		26 Oct 22	17:23	-	26.82	1.53	5.56	8.82	
26 Oct 22	17:03	-	26.76	1.49	5.63	8.82	8.77	26 Oct 22	17:24	-	26.80	1.57	5.59	8.79	
26 Oct 22	17:04	-	26.76	1.45	5.62			26 Oct 22	17:25	-	26.68	1.50	5.53	8.88	
26 Oct 22	17:05	-	26.84	1.59	5.62	8.68		26 Oct 22	17:26	-	26.68	1.60	5.59	8.86	
26 Oct 22	17:06	-	26.86	1.47	5.63	8.72		26 Oct 22	17:27	-	26.79	1.46	5.53	8.81	
26 Oct 22	17:07	-	27.00	1.48	5.64	8.72		26 Oct 22	17:28	-	26.91	1.60	5.55	8.88	
26 Oct 22	17:08	-	27.23	1.45	5.71	8.69		26 Oct 22	17:29	-	26.70	1.60	5.55	8.88	
26 Oct 22	17:09	-	27.23	1.53	5.71	8.69		26 Oct 22	17:30	-	26.74	1.63	5.61	8.66	
26 Oct 22	17:10	-	27.23	1.53	5.71	8.69		26 Oct 22	17:31	-	26.74	1.60	5.60	8.71	
26 Oct 22	17:11	-	27.26	1.52	5.63	8.82		26 Oct 22	17:32	-	27.21	1.57	5.68	8.71	
26 Oct 22	17:12	-	26.58	1.56	5.60	8.82		26 Oct 22	17:33	-	26.66	1.58	5.67	8.81	
26 Oct 22	17:13	-	26.89	1.58	5.59	8.82		26 Oct 22	17:34	-	26.66	1.58	5.67	8.81	
26 Oct 22	17:14	-	26.84	1.62	5.56	8.82		26 Oct 22	17:35	-	26.55	1.54	5.59	8.82	
26 Oct 22	17:15	-	26.84	1.62	5.56	8.82		26 Oct 22	17:36	-	26.55	1.62	5.52	8.85	
26 Oct 22	17:16	-	26.84	1.58	5.55	8.88		26 Oct 22	17:37	-	26.63	1.59	5.51	8.88	
26 Oct 22	17:17	-	26.84	1.52	5.49	8.88		26 Oct 22	17:38	-	26.55	1.58	5.48	8.88	
26 Oct 22	17:18	-	26.72	1.49	5.52	8.81		26 Oct 22	17:39	-	26.38	1.70	5.48	8.88	
26 Oct 22	17:19	-	26.69	1.60	5.58	8.88		26 Oct 22	17:40	-	26.51	1.61	5.58	8.88	
26 Oct 22	17:20	-	26.69	1.60	5.58	8.88		26 Oct 22	17:41	-	26.51	1.61	5.58	8.88	
Max		-	27.06	1.62	5.73	8.68		Max		-	27.21	1.70	5.68	8.66	
Avg		-	26.87	1.51	5.61	8.78		Avg		-	26.84	1.57	5.61	8.65	



ANALYZER CALIBRATION DATA

Lot No. 2229824-1

Client : Siam Styrene Monomer Co., Ltd. Location : Fird Heater (AF-9)
Date : 26 Oct 22 Test Operator : Sakit 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	-0.17	-0.05	0.48
Low-Level Gas	7.93	7.76	7.88	0.48
Span Gas	16.00	15.83	15.95	0.48

NO_x ANALYZER

Model : TELEDYNE API 200EH Serial No. : 774
Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.45	-0.10	0.35
Low-Level Gas	50.41	49.96	50.31	0.35
Span Gas	80.27	79.82	80.17	0.35

CO ANALYZER

Model : TELEDYNE API 300EM Serial No. : 451
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	0.00	0.02
Low-Level Gas	50.31	50.33	50.31	0.02
Span Gas	80.53	80.55	80.53	0.02

Calibrated by

(Mr. Sakit Phaisanphaut)
Environmental Field Scientist (4)

FORM NO. F 05-002 REVISION NO. 2 ISSUE DATE: 306/19
ALS Laboratory Group



SYSTEM CALIBRATION BIAS AND DRIFT DATA

Lot No. 2229824-1

Client : Siam Styrene Monomer Co., Ltd. Location : Fird Heater (AF-9)
Date : 26 Oct 22 Test Operator : Sakit 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	-0.17	-0.17	0.00	-0.05	0.48	0.48
Upscale Gas	15.83	15.83	0.00	15.95	0.48	0.48

NO_x ANALYZER

Cylinder Conc. (ppm) : 80.27 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	-0.45	-0.45	0.00	-0.10	0.35	0.35
Upscale Gas	79.82	79.82	0.00	80.17	0.35	0.35

CO ANALYZER

Cylinder Conc. (ppm) : 80.53 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	0.02	0.00	0.00	0.02	0.02
Upscale Gas	80.55	80.55	0.00	80.53	0.02	0.02

Calibrated by

(Mr. Sakit Phaisanphaut)

Environmental Field Scientist (4)

FORM NO. F 05-002 REVISION NO. 2 ISSUE DATE: 306/19
ALS Laboratory Group



EMISSION TEST RESULT

Client	Slam Styrene Monomer Co., Ltd.	Run #	1
Date	26 Oct 22	Location	Fixed Heater (A-E-9)
Start Time	13:15	Test Operator	Sakot P.
SO ₂ Analyzer Model	TELEDYNE API 100EH	Finish Time	13:35
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.	437
CO/CO ₂ Analyzer Model	TELEDYNE API 300EH	Serial No.	774
		Serial No.	451

Time (min)	O ₂ (%)	CO ₂ (%)	NOx (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
13:15	4.18	9.90	22.24	-	0.09	
13:16	4.25	9.87	23.09	-	0.08	
13:17	4.15	9.89	23.36	-	0.11	
13:18	4.01	9.97	23.35	-	0.14	
13:19	4.04	9.98	23.19	-	0.14	
13:20	4.17	9.93	23.15	-	0.08	
13:21	4.38	9.78	23.26	-	0.12	
13:22	4.22	9.89	23.40	-	0.15	
13:23	4.13	9.97	23.46	-	0.08	
13:24	4.16	9.85	23.39	-	0.07	
13:25	4.18	9.93	23.41	-	0.08	
13:26	4.22	9.86	23.49	-	0.10	
13:27	4.05	9.95	23.48	-	0.10	
13:28	4.08	10.00	23.47	-	0.10	
13:29	4.07	9.99	23.51	-	0.55	
13:30	4.04	10.00	23.51	-	0.58	
13:31	4.22	9.90	23.54	-	0.06	
13:32	4.26	9.85	23.62	-	0.06	
13:33	4.30	9.84	23.48	-	0.11	
13:34	4.25	9.91	23.37	-	0.07	
13:35	4.30	9.83	23.44	-	0.11	
Average	4.17	9.91	23.34	-	0.14	

Sakot P.

(Mr.Sakot Phaisanphat)

Environmental Field Scientist (4)



EMISSION TEST RESULT

Client	Slam Styrene Monomer Co., Ltd.	Run #	2
Date	26 Oct 22	Location	Fixed Heater (A-E-9)
Start Time	13:36	Test Operator	Sakot P.
SO ₂ Analyzer Model	TELEDYNE API 100EH	Finish Time	13:56
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.	437
CO/CO ₂ Analyzer Model	TELEDYNE API 300EH	Serial No.	774
		Serial No.	451

Time (min)	O ₂ (%)	CO ₂ (%)	NOx (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
13:36	4.22	9.88	23.55	-	0.05	
13:37	4.08	9.93	23.59	-	0.08	
13:38	4.03	10.02	23.39	-	0.08	
13:39	4.16	9.96	23.20	-	0.03	
13:40	4.17	9.95	23.20	-	0.05	
13:41	4.18	9.93	23.26	-	0.07	
13:42	4.18	9.92	23.19	-	0.07	
13:43	4.20	9.89	23.16	-	0.06	
13:44	4.16	9.91	23.14	-	0.06	
13:45	4.21	9.89	23.07	-	0.10	
13:46	4.20	9.93	23.91	-	0.10	
13:47	4.34	9.89	22.90	-	0.11	
13:48	4.26	9.87	23.24	-	0.11	
13:49	4.23	9.87	23.28	-	0.10	
13:50	4.18	9.95	23.18	-	0.09	
13:51	4.25	9.89	23.14	-	0.15	
13:52	4.23	9.88	23.11	-	0.13	
13:53	4.24	9.86	23.03	-	0.11	
13:54	4.15	9.92	22.90	-	0.03	
13:55	4.16	9.96	22.85	-	0.06	
13:56	4.21	9.96	22.90	-	0.10	
Average	4.19	9.92	23.15	-	0.08	

Sakot P.

(Mr.Sakot Phaisanphat)

Environmental Field Scientist (4)



EMISSION TEST RESULT

Client	Siam Styrene Monomer Co., Ltd.	Run #	3
Date	28 Oct 22	Location	Fired Heater (AF-8)
Start Time	13:57	Test Operator	Sakait P.
SO ₂ Analyzer Model	TELEDYNE API 100EH	Finish Time	14:17
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
13:57	4.24	9.91	23.11	-	0.13	
13:58	4.32	9.85	23.12	-	0.12	
13:59	4.52	9.72	23.12	-	0.13	
14:00	4.55	9.68	23.34	-	0.15	
14:01	4.52	9.73	23.52	-	0.15	
14:02	4.48	9.75	23.50	-	0.18	
14:03	4.50	9.73	23.38	-	0.17	
14:04	4.38	9.76	23.34	-	0.14	
14:05	4.19	9.91	23.16	-	0.16	
14:06	4.29	9.88	23.07	-	0.16	
14:07	4.30	9.87	22.90	-	0.13	
14:08	4.32	9.84	22.99	-	0.16	
14:09	4.36	9.81	23.06	-	0.15	
14:10	4.31	9.81	23.13	-	0.22	
14:11	4.25	9.86	23.13	-	0.03	
14:12	4.22	9.90	23.16	-	0.21	
14:13	4.17	9.95	23.09	-	0.19	
14:14	4.22	9.94	23.02	-	0.19	
14:15	4.31	9.85	22.99	-	0.21	
14:16	4.36	9.80	22.96	-	0.24	
14:17	4.29	9.92	22.93	-	0.24	
Average	4.34	9.83	23.14	-	0.17	

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



ANALYZER CALIBRATION DATA

Client	Siam Styrene Monomer Co., Ltd.	Location	Fired Heater (AF-9)
Date	26 Oct 22	Test Operator	Sakait P.
O ₂ 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	-0.17	-0.05	0.48
Low-Level Gas	7.93	7.76	7.88	0.48
Span Gas	16.00	15.83	15.95	0.48

NO _x ANALYZER			
Model	TELEDYNE API 200EH	Serial No.	774
Span (ppm)	100		

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.45	-0.10	0.35
Low-Level Gas	50.41	49.96	50.31	0.35
Span Gas	80.27	79.82	80.17	0.35

CO ANALYZER			
Model	TELEDYNE API 300EM	Serial No.	451
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	0.00	0.02
Low-Level Gas	50.31	50.33	50.31	0.02
Span Gas	80.53	80.55	80.53	0.02

Calibrated by

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



Lot No. 2223924-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Siam Styrene Monomer Co., Ltd. Location : Fined Heater (AF-9)
Date : 26 Oct 22 Test Operator : Sakitt P.

O₂ ANALYZER
Cylinder Conc. (%) : 16.00

Span (%) : 25

	Initial Values		Final Values		Drift (% of Span)
	O ₂ Analyzer Calibration Response	System Calibration Response	System Cal Bias (% of Span)	System Cal Bias (% of Span)	
Zero Gas	-0.17	-0.17	0.00	0.00	0.48
Upscale Gas	15.83	15.83	0.00	0.48	0.48

NO_x ANALYZER
Cylinder Conc. (ppm) : 80.27

Span (ppm) : 100

	Initial Values		Final Values		Drift (% of Span)
	NO _x Analyzer Calibration Response	System Calibration Response	System Cal Bias (% of Span)	System Cal Bias (% of Span)	
Zero Gas	-0.45	-0.45	0.00	0.35	0.35
Upscale Gas	79.82	79.82	0.00	80.17	0.35

CO ANALYZER
Cylinder Conc. (ppm) : 80.53

Span (ppm) : 100

	Initial Values		Final Values		Drift (% of Span)
	CO Analyzer Calibration Response	System Calibration Response	System Cal Bias (% of Span)	System Cal Bias (% of Span)	
Zero Gas	0.02	0.02	0.00	0.02	0.02
Upscale Gas	80.55	80.55	0.00	80.53	0.02

Calibrated by

Sakitt P.

(Mr. Sakitt Phaisanphieut)

Environmental Field Scientist (4)

FORM NO.: F-06-104 REVISION NO.: 1 ISSUE DATE: 306/19

ALS Laboratory Group



CEMS Data

Client Name : Siam Styrene Monomer Co., Ltd.
Plant Name : Map 15 PNU-ESSM (SSM)

Date : 26 Oct 22
Location : Fined Heater (AF-9)

Time Base : 21 min									
Run No. 2									
Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%	SO2 ppm	NOx ppm	CO ppm
26 Oct 22	13:36	-	25.99	0.89	4.32	-	-	25.98	0.91
26 Oct 22	13:37	-	25.98	0.91	4.47	-	-	25.94	0.97
26 Oct 22	13:38	-	26.04	0.97	4.49	-	-	26.02	0.98
26 Oct 22	13:39	-	26.02	0.98	4.38	-	-	26.02	0.98
26 Oct 22	13:40	-	26.02	0.98	4.44	-	-	26.11	0.98
26 Oct 22	13:41	-	26.11	0.98	4.38	-	-	26.17	0.99
26 Oct 22	13:42	-	26.17	0.99	4.38	-	-	26.05	0.91
26 Oct 22	13:43	-	26.05	0.91	4.45	-	-	26.57	0.91
26 Oct 22	13:44	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:45	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:46	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:47	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:48	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:49	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:50	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:51	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:52	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:53	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:54	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:55	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:56	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:57	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:58	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	13:59	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:00	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:01	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:02	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:03	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:04	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:05	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:06	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:07	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:08	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:09	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:10	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:11	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:12	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:13	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:14	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:15	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:16	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:17	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:18	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:19	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:20	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:21	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:22	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:23	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:24	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:25	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:26	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:27	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:28	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:29	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:30	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:31	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:32	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:33	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:34	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:35	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:36	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:37	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:38	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:39	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:40	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:41	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:42	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:43	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:44	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:45	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:46	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:47	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:48	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:49	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:50	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:51	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:52	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:53	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:54	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:55	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:56	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:57	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:58	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	14:59	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:00	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:01	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:02	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:03	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:04	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:05	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:06	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:07	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:08	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:09	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:10	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:11	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:12	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:13	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:14	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:15	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:16	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:17	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:18	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:19	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:20	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:21	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:22	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:23	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:24	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:25	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:26	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:27	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:28	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:29	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:30	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:31	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:32	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:33	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:34	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:35	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:36	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:37	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:38	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:39	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:40	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:41	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:42	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:43	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:44	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:45	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:46	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:47	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:48	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:49	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:50	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:51	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:52	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:53	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:54	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:55	-	26.57	0.92	4.45	-	-	26.57	0.92
26 Oct 22	15:56	-	26.57	0.92	4.45	-	-		



Client Name	Siam Styrene Monomer Co., Ltd.
Plant Name	Map To Phut_EBSM (SSMC)

Date 26 Oct 22
Location Fired Heater (AF)

Reference Method Data



Client Name	Siam Styrene Monomer Co., Ltd.
Plant Name	Map Ta Phut_EBSM (SSMC)

Date 26 Oct 22
Location Fred Hoeler (AF-9)

Run No. 7

Time Base : 21 min

Date	Time	S02	NOx	CO	O2	CO2	CO	O2	CO2
25-04-22	15:31	-	25.47	0.67	4.49	-	24.64	0.89	4.56
25-04-22	15:32	-	24.95	0.61	4.55	-	25.36	0.82	4.51
25-04-22	15:33	-	25.19	0.67	4.56	-	25.02	0.66	4.53
25-04-22	15:34	-	25.27	0.65	4.57	-	25.04	0.82	4.58
25-04-22	15:35	-	25.29	0.63	4.59	-	24.86	0.65	4.40
25-04-22	15:36	-	25.49	0.71	4.54	-	25.06	0.65	4.40
25-04-22	15:37	-	25.55	0.68	4.61	-	25.06	0.65	4.40
25-04-22	15:38	-	25.55	0.65	4.59	-	25.02	0.65	4.40
25-04-22	15:39	-	25.55	0.65	4.59	-	25.02	0.65	4.40
25-04-22	15:40	-	25.55	0.65	4.59	-	25.02	0.65	4.40
25-04-22	15:41	-	25.55	0.65	4.59	-	25.02	0.65	4.40
25-04-22	15:42	-	25.55	0.65	4.59	-	25.02	0.65	4.40
25-04-22	15:43	-	25.55	0.65	4.59	-	25.02	0.65	4.40
25-04-22	15:44	-	25.55	0.65	4.59	-	25.02	0.65	4.40
25-04-22	15:45	-	25.55	0.65	4.59	-	25.02	0.65	4.40
25-04-22	15:46	-	25.55	0.65	4.59	-	25.02	0.65	4.40
25-04-22	15:47	-	25.55	0.65	4.59	-	25.02	0.65	4.40
25-04-22	15:48	-	25.55	0.65	4.59	-	25.02	0.65	4.40
25-04-22	15:49	-	25.55	0.65	4.59	-	25.02	0.65	4.40
25-04-22	15:50	-	25.55	0.67	4.47	-	25.02	0.67	4.47
25-04-22	15:51	-	25.14	0.64	4.43	-	25.14	0.64	4.43
25-04-22	15:52	-	25.47	0.74	4.40	-	25.43	0.64	4.40
25-04-22	15:53	-	25.04	0.72	4.56	-	24.68	0.82	4.41
25-04-22	15:54	-	25.06	0.70	4.69	-	24.64	0.83	4.35
25-04-22	15:55	-	25.29	0.67	4.54	-	24.73	0.85	4.35
25-04-22	15:56	-	25.17	0.65	4.50	-	24.85	0.85	4.35
25-04-22	15:57	-	25.17	0.65	4.50	-	24.85	0.85	4.35
25-04-22	15:58	-	25.47	0.67	4.48	-	25.06	0.83	4.07
25-04-22	15:59	-	25.59	0.72	4.47	-	24.65	0.83	4.07
25-04-22	16:00	-	25.31	0.71	4.46	-	24.61	0.81	3.93
25-04-22	16:01	-	24.58	0.67	4.58	-	23.89	0.65	3.84
25-04-22	16:02	-	25.03	0.64	4.53	-	23.49	0.58	3.74
25-04-22	16:03	-	25.47	0.73	4.29	-	25.43	0.78	4.34
25-04-22	16:04	-	25.16	0.68	4.25	-	24.69	0.58	4.25

Time Base : 21 min

Date	Time	S02	NOx	CO	O2	CO2	CO	O2	CO2
25-04-22	16:05	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:06	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:07	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:08	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:09	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:10	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:11	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:12	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:13	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:14	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:15	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:16	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:17	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:18	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:19	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:20	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:21	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:22	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:23	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:24	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:25	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:26	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:27	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:28	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:29	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:30	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:31	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:32	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:33	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:34	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:35	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:36	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:37	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:38	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:39	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:40	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:41	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:42	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:43	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:44	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:45	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:46	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:47	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:48	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:49	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:50	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:51	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:52	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:53	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:54	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:55	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:56	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:57	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:58	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	16:59	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:00	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:01	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:02	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:03	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:04	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:05	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:06	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:07	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:08	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:09	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:10	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:11	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:12	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:13	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:14	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:15	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:16	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:17	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:18	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:19	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:20	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:21	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:22	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:23	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:24	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:25	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:26	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:27	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:28	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:29	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:30	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:31	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:32	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:33	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:34	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:35	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:36	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:37	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:38	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:39	-	25.16	0.68	4.25	-	25.43	0.78	4.34
25-04-22	17:40	-	25.16	0.68	4.25	-	25.43	0.78	4.34

Run No: 1

Time Base: 21 min

Run No: 2

Time Base: 21 min

Time Base: 21 min											
Run No: 1											
Date	Time	502	NOx	CO	VO2	VO2	CO2	VO2	CO2		
		ppm	ppm	ppm	%Vol	%Vol	%Vol	%Vol	%Vol		
26 Oct 22	13:15	-	22.24	0.10	4.16	9.87	-	23.65	0.05	4.22	9.88
26 Oct 22	13:16	-	22.09	0.09	4.15	9.80	-	23.69	0.10	4.09	9.53
26 Oct 22	13:17	-	23.35	0.12	4.15	9.69	-	23.20	0.07	4.03	10.02
26 Oct 22	13:18	-	23.25	0.15	4.01	9.97	-	23.20	0.04	4.16	9.56
26 Oct 22	13:19	-	23.19	0.15	4.04	9.88	-	23.25	0.10	4.14	9.53
26 Oct 22	13:20	-	23.25	0.14	4.28	9.78	-	23.25	0.10	4.14	9.53
26 Oct 22	13:21	-	23.29	0.16	4.32	9.78	-	23.19	0.04	4.19	9.92
26 Oct 22	13:22	-	23.49	0.16	4.16	4.22	9.57	23.15	0.06	4.20	9.57
26 Oct 22	13:23	-	23.46	0.09	4.15	9.57	-	23.14	0.06	4.16	9.55
26 Oct 22	13:24	-	23.29	0.08	4.16	9.55	-	23.07	0.11	4.21	9.83
26 Oct 22	13:25	-	23.41	0.09	4.14	9.93	-	23.91	0.11	4.20	9.83
26 Oct 22	13:26	-	23.49	0.11	4.05	9.96	-	23.80	0.13	4.24	9.89
26 Oct 22	13:27	-	23.43	0.11	4.05	9.96	-	23.28	0.12	4.26	9.87
26 Oct 22	13:28	-	23.47	0.11	4.09	10.00	-	23.28	0.12	4.26	9.87
26 Oct 22	13:29	-	23.41	0.11	4.09	10.00	-	23.28	0.12	4.26	9.87
26 Oct 22	13:30	-	23.41	0.11	4.09	10.00	-	23.14	0.10	4.14	9.85
26 Oct 22	13:31	-	23.51	0.02	4.94	10.00	-	23.14	0.16	4.25	9.88
26 Oct 22	13:32	-	23.54	0.06	4.42	9.50	-	23.11	0.14	4.23	9.85
26 Oct 22	13:32	-	23.63	0.06	4.26	9.63	-	23.63	0.12	4.24	9.85
26 Oct 22	13:33	-	23.48	0.12	4.30	9.64	-	23.80	0.04	4.15	9.82
26 Oct 22	13:34	-	23.37	0.09	4.25	9.31	-	22.85	0.06	4.15	9.96
26 Oct 22	13:35	-	23.44	0.12	4.30	9.83	-	22.90	0.11	4.21	9.95
Max		-	23.62	0.32	4.30	10.00	-	23.59	0.16	4.21	10.02
Avg		-	23.34	0.16	4.17	9.81	-	23.15	0.08	4.18	9.82
Time Base: 21 min											
Run No: 2											
Date	Time	502	NOx	CO	VO2	VO2	CO2	VO2	CO2		
		ppm	ppm	ppm	%Vol	%Vol	%Vol	%Vol	%Vol		
26 Oct 22	13:38	-	23.65	0.05	4.22	9.87	-	23.65	0.05	4.22	9.88
26 Oct 22	13:37	-	23.65	0.10	4.09	9.53	-	23.69	0.10	4.09	9.53
26 Oct 22	13:38	-	23.20	0.07	4.03	10.02	-	23.20	0.04	4.16	9.56
26 Oct 22	13:39	-	23.19	0.15	4.04	9.88	-	23.25	0.10	4.14	9.53
26 Oct 22	13:40	-	23.25	0.14	4.28	9.78	-	23.25	0.10	4.14	9.53
26 Oct 22	13:41	-	23.49	0.16	4.16	4.22	9.57	23.15	0.06	4.19	9.92
26 Oct 22	13:42	-	23.46	0.09	4.15	9.57	-	23.14	0.06	4.20	9.57
26 Oct 22	13:43	-	23.29	0.08	4.16	9.55	-	23.07	0.11	4.21	9.83
26 Oct 22	13:44	-	23.41	0.09	4.14	9.93	-	23.91	0.11	4.20	9.83
26 Oct 22	13:45	-	23.49	0.11	4.05	9.96	-	23.80	0.13	4.24	9.89
26 Oct 22	13:46	-	23.43	0.11	4.05	9.96	-	23.28	0.12	4.26	9.87
26 Oct 22	13:47	-	23.47	0.11	4.09	10.00	-	23.28	0.12	4.26	9.87
26 Oct 22	13:48	-	23.41	0.11	4.09	10.00	-	23.28	0.12	4.26	9.87
26 Oct 22	13:49	-	23.41	0.11	4.09	10.00	-	23.14	0.10	4.14	9.85
26 Oct 22	13:50	-	23.51	0.02	4.94	10.00	-	23.14	0.16	4.25	9.88
26 Oct 22	13:51	-	23.54	0.06	4.42	9.50	-	23.11	0.14	4.23	9.85
26 Oct 22	13:52	-	23.63	0.06	4.26	9.63	-	23.63	0.12	4.24	9.85
26 Oct 22	13:53	-	23.48	0.12	4.30	9.64	-	23.80	0.04	4.15	9.82
26 Oct 22	13:54	-	23.37	0.09	4.25	9.31	-	22.85	0.06	4.15	9.96
26 Oct 22	13:55	-	23.44	0.12	4.30	9.83	-	22.90	0.11	4.21	9.95
Max		-	23.62	0.32	4.30	10.00	-	23.59	0.16	4.21	10.02
Avg		-	23.34	0.16	4.17	9.81	-	23.15	0.08	4.18	9.82
Time Base: 21 min											
Run No: 3											
Date	Time	502	NOx	CO	VO2	VO2	CO2	VO2	CO2		
		ppm	ppm	ppm	%Vol	%Vol	%Vol	%Vol	%Vol		
26 Oct 22	13:37	-	23.11	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:38	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:39	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:40	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:41	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:42	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:43	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:44	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:45	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:46	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:47	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:48	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:49	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:50	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:51	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:52	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:53	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:54	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:55	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:56	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:57	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:58	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	13:59	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:00	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:01	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:02	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:03	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:04	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:05	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:06	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:07	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:08	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:09	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:10	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:11	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:12	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:13	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:14	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:15	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:16	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:17	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:18	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:19	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:20	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:21	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:22	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:23	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:24	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:25	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:26	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:27	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:28	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:29	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:30	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:31	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:32	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:33	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:34	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:35	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:36	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:37	-	23.13	0.14	4.24	9.91	-	23.13	0.20	4.32	9.95
26 Oct 22	14:38	-	23.13	0.14	4.24</						



Reference Method Data

Client Name : Siam Styrene Monomer Co., Ltd.
Plant Name : Map Ta Phut (ESMO)

Date : 26 Oct 22
Location : Feed Header (A-4)

Lot No. : 2229825-1

ANALYZER CALIBRATION DATA

Client : Siam Styrene Monomer Co., Ltd. Location : Styrene Furnace
Date : 27 Oct 22 Test Operator : Sathaporn Th.
O₂ ANALYZER : 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	0.00	0.08	0.32
Low-Level Gas	8.04	8.05	8.10	0.20
Span Gas	16.00	16.00	16.12	0.48

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

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.04	0.04
Low-Level Gas	54.96	54.95	54.93	0.02
Span Gas	79.42	79.42	79.35	0.07

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

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.07	0.07
Low-Level Gas	54.84	54.82	54.80	0.02
Span Gas	80.16	80.16	80.10	0.06

Calibrated by

Sathaporn Th.

(Mr. Sathaporn Thabaeuw)
Environmental Field Scientist (3)

FORM NO. F 06-022 REVISION NO. 2 ISSUE DATE: 30/01/19
ALS Laboratory Group

Run No. : 7 Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
26 Oct 22	15:21	-	22.32	0.05	4.24	9.88
26 Oct 22	15:22	-	22.26	0.14	4.29	9.88
26 Oct 22	15:23	-	22.17	0.22	4.38	9.88
26 Oct 22	15:24	-	22.10	0.30	4.45	9.88
26 Oct 22	15:25	-	22.04	0.35	4.55	9.87
26 Oct 22	15:26	-	22.01	0.35	4.70	9.88
26 Oct 22	15:27	-	22.04	0.24	4.75	9.88
26 Oct 22	15:28	-	22.14	0.20	4.79	9.87
26 Oct 22	15:29	-	22.17	0.27	4.75	9.87
26 Oct 22	15:30	-	22.37	0.26	4.91	9.82
26 Oct 22	15:31	-	22.41	0.23	4.98	9.88
26 Oct 22	15:32	-	22.45	0.23	5.05	9.88
26 Oct 22	15:33	-	22.45	0.18	5.18	9.84
26 Oct 22	15:34	-	22.42	0.23	5.24	9.84
26 Oct 22	15:35	-	22.32	0.25	5.33	9.84
26 Oct 22	15:36	-	22.36	0.27	5.30	9.85
26 Oct 22	15:37	-	22.46	0.31	5.28	9.86
26 Oct 22	15:38	-	22.56	0.24	5.31	9.85
26 Oct 22	15:39	-	22.64	0.19	5.41	9.85
26 Oct 22	15:40	-	22.68	0.18	5.41	9.85
26 Oct 22	15:41	-	22.68	0.18	5.41	9.85
Max		-	22.68	0.31	5.45	9.91
Avg		-	22.38	0.27	5.28	9.88

Run No. : 8 Time Base : 21 min

Date	Time	SO2 ppm	NOx ppm	CO ppm	O2 Vol%	CO2 Vol%
25 Oct 22	15:03	-	21.37	4.96	3.38	10.41
25 Oct 22	15:04	-	21.37	4.96	3.38	10.41
25 Oct 22	15:05	-	20.97	5.11	3.69	10.57
25 Oct 22	15:06	-	20.47	27.15	3.62	10.58
25 Oct 22	15:07	-	20.47	27.15	3.62	10.58
25 Oct 22	15:08	-	20.24	19.36	3.03	10.50
25 Oct 22	15:09	-	20.24	19.36	3.03	10.50
25 Oct 22	15:10	-	20.24	19.36	3.03	10.50
25 Oct 22	15:11	-	20.24	19.36	3.03	10.50
25 Oct 22	15:12	-	21.72	6.14	4.27	9.97
25 Oct 22	15:13	-	21.96	6.24	4.27	9.86
25 Oct 22	15:14	-	22.09	6.27	4.27	9.87
25 Oct 22	15:15	-	22.11	6.23	4.28	9.86
25 Oct 22	15:16	-	22.12	6.35	4.28	9.82
25 Oct 22	15:17	-	22.18	6.35	4.28	9.86
25 Oct 22	15:18	-	22.28	6.31	4.21	9.89
25 Oct 22	15:19	-	22.45	6.36	4.24	9.89
25 Oct 22	15:20	-	22.46	6.25	4.25	9.87
25 Oct 22	15:21	-	22.43	6.34	4.28	9.86
25 Oct 22	15:22	-	22.50	6.35	4.31	9.86
25 Oct 22	15:23	-	22.51	6.36	4.31	9.86
25 Oct 22	15:24	-	22.57	6.31	4.24	9.89
25 Oct 22	15:25	-	22.54	6.14	4.32	9.86
25 Oct 22	15:26	-	22.49	6.15	4.32	9.86
25 Oct 22	15:27	-	22.47	6.15	4.32	9.86
25 Oct 22	15:28	-	22.48	6.17	4.28	9.85
25 Oct 22	15:29	-	22.50	6.21	4.28	9.86
25 Oct 22	15:30	-	22.50	6.21	4.28	9.86
25 Oct 22	15:31	-	22.50	6.21	4.28	9.86
25 Oct 22	15:32	-	22.50	6.21	4.28	9.86
25 Oct 22	15:33	-	22.50	6.21	4.28	9.86
25 Oct 22	15:34	-	22.50	6.21	4.28	9.86
25 Oct 22	15:35	-	22.50	6.21	4.28	9.86
25 Oct 22	15:36	-	22.50	6.21	4.28	9.86
25 Oct 22	15:37	-	22.50	6.21	4.28	9.86
25 Oct 22	15:38	-	22.50	6.21	4.28	9.86
25 Oct 22	15:39	-	22.50	6.21	4.28	9.86
25 Oct 22	15:40	-	22.50	6.21	4.28	9.86
25 Oct 22	15:41	-	22.50	6.21	4.28	9.86
25 Oct 22	15:42	-	22.50	6.21	4.28	9.86
25 Oct 22	15:43	-	22.50	6.21	4.28	9.86
25 Oct 22	15:44	-	22.50	6.21	4.28	9.86
25 Oct 22	15:45	-	22.50	6.21	4.28	9.86
25 Oct 22	15:46	-	22.50	6.21	4.28	9.86
25 Oct 22	15:47	-	22.50	6.21	4.28	9.86
25 Oct 22	15:48	-	22.50	6.21	4.28	9.86
25 Oct 22	15:49	-	22.50	6.21	4.28	9.86
25 Oct 22	15:50	-	22.50	6.21	4.28	9.86
25 Oct 22	15:51	-	22.50	6.21	4.28	9.86
25 Oct 22	15:52	-	22.50	6.21	4.28	9.86
25 Oct 22	15:53	-	22.50	6.21	4.28	9.86
25 Oct 22	15:54	-	22.50	6.21	4.28	9.86
25 Oct 22	15:55	-	22.50	6.21	4.28	9.86
25 Oct 22	15:56	-	22.50	6.21	4.28	9.86
25 Oct 22	15:57	-	22.50	6.21	4.28	9.86
25 Oct 22	15:58	-	22.50	6.21	4.28	9.86
25 Oct 22	15:59	-	22.50	6.21	4.28	9.86
25 Oct 22	16:00	-	22.50	6.21	4.28	9.86
25 Oct 22	16:01	-	22.50	6.21	4.28	9.86
25 Oct 22	16:02	-	22.50	6.21	4.28	9.86
25 Oct 22	16:03	-	22.50	6.21	4.28	9.86
25 Oct 22	16:04	-	22.50	6.21	4.28	9.86
25 Oct 22	16:05	-	22.50	6.21	4.28	9.86
25 Oct 22	16:06	-	22.50	6.21	4.28	9.86
25 Oct 22	16:07	-	22.50	6.21	4.28	9.86
25 Oct 22	16:08	-	22.50	6.21	4.28	9.86
25 Oct 22	16:09	-	22.50	6.21	4.28	9.86
25 Oct 22	16:10	-	22.50	6.21	4.28	9.86
25 Oct 22	16:11	-	22.50	6.21	4.28	9.86
25 Oct 22	16:12	-	22.50	6.21	4.28	9.86
25 Oct 22	16:13	-	22.50	6.21	4.28	9.86
25 Oct 22	16:14	-	22.50	6.21	4.28	9.86
25 Oct 22	16:15	-	22.50	6.21	4.28	9.86
25 Oct 22	16:16	-	22.50	6.21	4.28	9.86
25 Oct 22	16:17	-	22.50	6.21	4.28	9.86
25 Oct 22	16:18	-	22.50	6.21	4.28	9.86
25 Oct 22	16:19	-	22.50	6.21	4.28	9.86
25 Oct 22	16:20	-	22.50	6.21	4.28	9.86
25 Oct 22	16:21	-	22.50	6.21	4.28	9.86
25 Oct 22	16:22	-	22.50	6.21	4.28	9.86
25 Oct 22	16:23	-	22.50	6.21	4.28	9.86
25 Oct 22	16:24	-	22.50	6.21	4.28	9.86
25 Oct 22	16:25	-	22.50	6.21	4.28	9.86
25 Oct 22	16:26	-	22.50	6.21	4.28	9.86
25 Oct 22	16:27	-	22.50	6.21	4.28	9.86
25 Oct 22	16:28	-	22.50	6.21	4.28	9.86
25 Oct 22	16:29	-	22.50	6.21	4.28	9.86
25 Oct 22	16:30	-	22.50	6.21	4.28	9.86
25 Oct 22	16:31	-	22.50	6.21	4.28	9.86
25 Oct 22	16:32	-	22.50	6.21	4.28	9.86
25 Oct 22	16:33	-	22.50	6.21	4.28	9.86
25 Oct 22	16:34	-	22.50	6.21	4.28	9.86
25 Oct 22	16:35	-	22.50	6.21	4.28	9.86
25 Oct 22	16:36	-	22.50	6.21	4.28	9.86
25 Oct 22	16:37	-	22.50	6.21	4.28	9.86
25 Oct 22	16:38	-	22.50	6.21	4.28	9.86
25 Oct 22	16:39	-	22.50	6.21	4.28	9.86
25 Oct 22	16:40	-	22.50	6.21	4.28	9.86
25 Oct 22	16:41	-	22.50	6.21	4.28	9.86
25 Oct 22	16:42	-	22.50	6.21	4.28	9.86
25 Oct 22	16:43	-	22.50	6.21	4.28	9.86
25 Oct 22	16:44	-	22.50	6.21	4.28	9.86
25 Oct 22	16:45	-	22.50	6.21	4.28	9.86
25 Oct 22	16:46	-	22.50	6.21	4.28	9.86
25 Oct 22	16:47	-	22.50	6.21	4.28	9.86
25 Oct 22	16:48	-	22.50	6.21	4.28	9.86
25 Oct 22	16:49	-	22.50	6.21	4.28	9.86
25 Oct 22	16:50	-	22.50	6.21	4.28	9.86
25 Oct 22	16:51	-	22.50	6.21	4.28	9.86
25 Oct 22	16:52	-	22.50	6.21	4.28	9.86
25 Oct 22	16:53	-	22.50	6.21	4.28	9.86
25 Oct 22	16:54	-	22.50	6.21	4.28	9.86
25 Oct 22	16:55	-	22.50	6.21	4.28	9.86
25 Oct 22	16:56	-	22.50	6.21	4.28	9.86
25 Oct 22	16:57	-	22.50	6.21	4.28	9.86
25 Oct 22	16:58	-	22.50	6.21	4.28	9.86
25 Oct 22	16:59	-	22.50	6.21	4.28	9.86
25 Oct 22	17:00	-	22.50	6.21	4.28	9.86
25 Oct 22	17:01	-	22.50	6.21	4.28	9.86
25 Oct 22	17:02	-	22.50	6.21	4.28	9.86
25 Oct 22	17:03	-	22.50	6.21	4.28	9.86
25 Oct 22	17:04	-	22.50	6.21	4.28	9.86
25 Oct 22	17:05	-	22.50	6.21	4.28	9.86
25 Oct 22	17:06	-	22.50	6.21	4.28	9.86
25 Oct 22	17:07	-	22.50	6.21	4.28	9.86
25 Oct 22	17:08	-	22.50	6.21	4.28	9.86
25 Oct 22	17:09	-	22.50	6.21	4.28	9.86
25 Oct 22	17:10	-	22.50	6.21	4.28	9.86
25 Oct 22	17:11	-	22.50	6.21	4.28	9.86
25 Oct 22	17:12	-	22.50	6.21	4.28	9.86
25 Oct 22	17:13	-	22.50	6.21	4.28	9.86
25 Oct 22	17:14	-	22.50	6.21	4.28	9.86
25 Oct 22	17:15	-	22.50	6.21	4.28	9.86
25 Oct 22	17:16	-	22.50	6.21	4.28	9.86
25 Oct 22	17:17	-	22.50	6.21	4.28	9.86
25 Oct 22	17:18	-	22.50	6.21	4.28	9.86
25 Oct 22	17:19	-	22.50	6.21	4.28	9.86
25 Oct 22	17:20	-	22.50	6.21	4.28	9.86
25 Oct 22	17:21	-	22.50	6.21	4.28	9.86
25 Oct 22	17:22	-	22.50	6.21	4.28	9.86
25 Oct 22	17:23	-	22.50	6.21	4.28	9.86
25 Oct 22	17:24	-	22.50	6.21	4.28	9.86
25 Oct 22	17:25	-	22.50	6.21	4.28	9.86
25 Oct 22	17:26	-	22.50	6.21	4.28	9.86
25 Oct 22	17:27	-	22.50	6.21	4.28	9.86
25 Oct 22	17:28	-	22.50	6.21	4.28	9.86
25 Oct 22	17:29	-	22.50	6.21	4.28	9.86
25 Oct 22	17:30	-	22.50	6.21	4.28	9.86
25 Oct 22	17:31	-	22.50	6.21	4.28	9.86
25 Oct 22	17:32	-	22.50	6.21	4.28	9.86
25 Oct 22	17:33	-	22.50	6.21	4.28	9.86
25 Oct 22	17:34	-	22.50	6.21	4.28	9.86
25 Oct 22	17:35	-	22.50	6.21	4.28	9.86
25 Oct 22	17:36	-	22.50	6.21	4.28	9.86
25 Oct 22	17:37	-	22.50	6.21	4.28	9.86
25 Oct 22	17:38	-	22.50	6.21	4.28	9.86
25 Oct 22	17:39	-	22.50	6.21	4.28	9.86
25 Oct 22	17:40	-	22.50	6.21	4.28	9.86
25 Oct 22	17:41	-	22.50	6.21	4.28	9.86
25 Oct 22	17:42	-	22.50	6.21	4.28	9.86
25 Oct 22	17:43	-	22.50	6.21	4.28	9.86
25 Oct 22	17:44	-	22.50	6.21	4.28	9.86
25 Oct 22	17:45	-	22.50	6.21	4.28	9.86
25 Oct 22	17:46	-	22.50	6.21	4.28	9.86
25 Oct 22	17:47	-	22.50	6.21	4.28	9.86
25 Oct 22	17:48	-	22.50	6.21	4.28	9.86
25 Oct 22	17:49	-	22.50	6.21	4.28	9.86
25 Oct 22	17:50	-	22.50	6.21	4.28	9.86
25 Oct 22	17:51	-	22.50	6.21	4.28	9.86
25 Oct 22	17:52	-	22.50	6.21	4.28	9.86
25 Oct 22	17:53	-	22.50	6.21	4.28	9.86
25 Oct 22	17:54	-	22.50	6.21	4.28	9.86
25 Oct 22	17:55	-	22.50	6.21	4.28	9.86
25 Oct 22	17:56	-	22.50	6.21	4.28	9.86
25 Oct 22	17:57	-	22.50	6.21	4.28	9.86
25 Oct 22	17:58	-	22.50	6.21	4.28	9.86
25 Oct 22	17:59	-	22.50	6.21	4.28	9.86
25 Oct 22	18:00	-	22.50	6.21	4.28	9.86
25 Oct 22	18:01	-	22.50	6.21	4.28	9.86
25 Oct 22	18:02	-	22.50	6.21	4.28	9.86
25 Oct 22	18:03	-	22.50	6.21	4.28	9.86
25 Oct 22	18:04	-	22.50	6.21	4.28	9.86
25 Oct 22	18:05	-	22.50	6.21	4.28	9.86
25 Oct 22	18:06	-	22.50			



Lot No. 2229825-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Siam Styrene Monomer Co., Ltd. Location : Styrene Furnace
Date : 27 Oct 22 Test Operator : Sathaporn T.

O₂ ANALYZER : 18.00 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	0.00	0.05	0.20	0.08	0.32	0.12
Upscale Gas	16.00	16.07	0.28	16.12	0.48	0.20

NO_x ANALYZER : 79.42 Span (ppm) : 100
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	0.00	0.03	0.03	0.04	0.04	0.01
Upscale Gas	79.42	79.38	0.04	79.35	0.07	0.03

CO ANALYZER : 80.16 Span (ppm) : 100
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	0.00	0.04	0.04	0.07	0.07	0.03
Upscale Gas	80.16	80.13	0.03	80.10	0.06	0.03

Calibrated by
Sathaporn Th.

(Mr. Sathaporn Thakasew)

Environmental Field Scientist (3)

FORM NO.: F 05-002 REVISION NO.: 2 ISSUE DATE: 30/01/19

ALS Laboratory Group



EMISSION TEST RESULT

Run # 1
Location Styrene Furnace
Test Operator Sathaporn T.
Finish Time 12:00
Serial No. 735
Serial No. 425

Client Siam Styrene Monomer Co., Ltd.
Date 27 Oct 22
Start Time 11:40
NO_x/O₂ Analyzer Model TELEDYNE API 200EH
CO/CO₂ Analyzer Model TELEDYNE API 300EH

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
11:40	9.07	3.98	67.67	-	2.13	
11:41	9.02	4.04	67.35	-	2.08	
11:42	8.98	4.02	67.47	-	2.16	
11:43	8.98	4.04	67.73	-	2.16	
11:44	9.01	3.98	67.93	-	2.18	
11:45	9.04	3.97	68.34	-	2.22	
11:46	9.06	3.94	68.52	-	2.17	
11:47	9.15	3.91	68.82	-	2.21	
11:48	9.11	3.86	68.10	-	2.20	
11:49	9.06	3.99	68.21	-	2.19	
11:50	9.01	4.01	68.56	-	2.17	
11:51	9.02	4.01	67.97	-	2.24	
11:52	9.01	4.02	67.72	-	2.32	
11:53	9.05	4.01	67.72	-	2.30	
11:54	9.06	4.00	67.56	-	2.33	
11:55	9.07	3.97	67.42	-	2.30	
11:56	9.13	3.98	67.15	-	2.34	
11:57	9.11	3.98	67.24	-	2.30	
11:58	9.09	3.96	67.50	-	2.32	
11:59	9.09	3.95	67.82	-	2.30	
12:00	9.03	4.04	67.72	-	2.33	
Average	9.06	3.99	67.83	-	2.24	

Sathaporn Th.

(Mr. Sathaporn Thakasew)

Environmental Field Scientist (3)

FORM NO.: F 05-002 REVISION NO.: 2 ISSUE DATE: 30/01/19

ALS Laboratory Group



EMISSION TEST RESULT

Client	Siam Styrene Monomer Co., Ltd.	Run #	2
Date	27 Oct 22	Location	Styrene Furnace
Start Time	12:01	Test Operator	Sathaporn Th.
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Finish Time	12:21
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.	735
		Serial No.	425

Time (min)	O ₂ (%)	CO ₂ (%)	NOx (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
12:01	9.03	4.01	67.61	-	2.35	
12:02	9.02	4.03	67.63	-	2.41	
12:03	9.02	4.02	67.65	-	2.41	
12:04	9.04	4.01	67.63	-	2.34	
12:05	9.08	3.95	67.79	-	2.43	
12:06	9.13	3.96	67.93	-	2.42	
12:07	9.12	3.95	67.74	-	2.44	
12:08	9.10	3.99	67.29	-	2.43	
12:09	9.08	3.99	67.43	-	2.40	
12:10	9.02	4.09	67.96	-	2.41	
12:11	9.03	4.05	68.28	-	2.47	
12:12	9.02	4.03	67.90	-	2.45	
12:13	9.09	3.94	67.65	-	2.46	
12:14	9.15	3.92	67.86	-	2.41	
12:15	9.14	3.92	67.95	-	2.44	
12:16	9.09	4.02	67.82	-	2.51	
12:17	9.03	4.04	67.96	-	2.46	
12:18	9.02	4.02	67.96	-	2.51	
12:19	9.06	4.00	67.76	-	2.49	
12:20	9.05	4.00	67.78	-	2.48	
12:21	9.09	4.00	67.96	-	2.51	
Average	9.07	4.00	67.78	-	2.44	

Sathaporn Th.

(Mr.Sathaporn Thakaw)

Environmental Field Scientist (3)



EMISSION TEST RESULT

Client	Siam Styrene Monomer Co., Ltd.	Run #	3
Date	27 Oct 22	Location	Styrene Furnace
Start Time	12:22	Test Operator	Sathaporn Th.
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Finish Time	12:42
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.	735
		Serial No.	425

Time (min)	O ₂ (%)	CO ₂ (%)	NOx (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
12:22	9.14	3.98	67.86	-	2.45	
12:23	9.13	3.97	67.81	-	2.44	
12:24	9.10	4.00	67.84	-	2.47	
12:25	9.08	4.00	67.31	-	2.49	
12:26	9.04	4.01	67.08	-	2.50	
12:27	9.01	3.99	67.19	-	2.50	
12:28	9.03	3.95	67.51	-	2.47	
12:29	9.10	3.99	67.55	-	2.47	
12:30	9.09	3.96	67.63	-	2.54	
12:31	9.09	3.96	67.63	-	2.51	
12:32	9.09	3.99	67.69	-	2.52	
12:33	9.03	3.99	67.73	-	2.51	
12:34	9.01	4.02	67.58	-	2.55	
12:35	9.02	4.02	67.59	-	2.55	
12:36	9.02	4.02	67.60	-	2.53	
12:37	9.03	3.95	68.02	-	2.57	
12:38	9.03	4.01	68.21	-	2.62	
12:39	9.06	3.96	68.15	-	2.54	
12:40	9.12	3.93	68.07	-	2.61	
12:41	9.17	3.91	67.98	-	2.63	
12:42	9.14	3.93	68.20	-	2.63	
Average	9.07	3.98	67.71	-	2.53	

Sathaporn Th.

(Mr.Sathaporn Thakaw)

Environmental Field Scientist (3)



ANALYZER CALIBRATION DATA

Lot No. 2229825-1

Client : Siam Styrene Monomer Co., Ltd. Location : Styrene Furnace
Date : 27 Oct 22 Test Operator : Sathaporn 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	0.00	0.08	0.32
Low-Level Gas	8.04	8.05	8.10	0.20
Span Gas	16.00	16.00	16.12	0.48

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	0.00	0.04	0.04
Low-Level Gas	54.96	54.95	54.93	0.02
Span Gas	79.42	79.42	79.35	0.07

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	0.00	0.07	0.07
Low-Level Gas	54.84	54.82	54.80	0.02
Span Gas	80.16	80.16	80.10	0.06

Calibrated by

Sathaporn Th.

(Mr. Sathaporn Thakasew)

Environmental Field Scientist (3)

FORM NO. : F 05-104 REVISION NO. : - ISSUE DATE: 306/19
ALS Laboratory Group



SYSTEM CALIBRATION BIAS AND DRIFT DATA

Lot No. 2229825-1

Client : Siam Styrene Monomer Co., Ltd. Location : Styrene Furnace
Date : 27 Oct 22 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	0.00	0.05	0.20	0.08	0.32	0.12
Upscale Gas	16.00	16.07	0.28	16.12	0.48	0.20

NO_x ANALYZER

Cylinder Conc. (ppm) : 79.42 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	0.00	0.03	0.03	0.04	0.04	0.01
Upscale Gas	79.42	79.38	0.04	79.35	0.07	0.03

CO ANALYZER

Cylinder Conc. (ppm) : 80.16 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	0.00	0.04	0.04	0.07	0.07	0.03
Upscale Gas	80.16	80.13	0.03	80.10	0.06	0.03

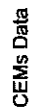
Calibrated by

Sathaporn Th.

(Mr. Sathaporn Thakasew)

Environmental Field Scientist (3)

FORM NO. : F 05-104 REVISION NO. : - ISSUE DATE: 306/19
ALS Laboratory Group



Date 27 Oct 22
Location Styrene Furnace

Date	27 Oct 22
Location	Styrene Furnace

Run No: 1										Run No: 2									
Time Base: 21 min										Time Base: 21 min									
Date	Time	SOT	HQs	CO	O2	CO2	Date	Time	SOT	HQs	CO	O2	CO2						
		ppm	ppm	ppm	%v/v	%v/v			ppm	ppm	ppm	%v/v	%v/v						
27/04/22	11:35	-	66.45	2.21	8.85	-	27/04/22	11:56	-	68.50	2.17	9.03	-						
27/04/22	11:36	-	66.45	2.21	8.85	-	27/04/22	11:57	-	68.50	2.18	9.03	-						
27/04/22	11:37	-	66.39	2.24	8.95	-	27/04/22	11:58	-	68.68	2.18	9.05	-						
27/04/22	11:38	-	66.39	2.24	8.95	-	27/04/22	11:59	-	68.68	2.18	9.05	-						
27/04/22	11:39	-	66.38	2.22	8.92	-	27/04/22	12:00	-	68.50	2.17	8.96	-						
27/04/22	11:40	-	66.56	2.59	8.72	-	27/04/22	12:01	-	68.56	2.19	8.94	-						
27/04/22	11:41	-	66.50	2.51	8.75	-	27/04/22	12:02	-	68.50	2.22	8.96	-						
27/04/22	11:42	-	66.95	2.81	8.78	-	27/04/22	12:03	-	68.53	2.23	9.02	-						
27/04/22	11:43	-	68.25	3.18	8.87	-	27/04/22	12:04	-	68.45	2.19	9.05	-						
27/04/22	11:44	-	68.30	2.18	8.86	-	27/04/22	12:05	-	68.72	2.23	9.08	-						
27/04/22	11:45	-	68.08	2.15	8.87	-	27/04/22	12:06	-	68.50	2.19	9.05	-						
27/04/22	11:46	-	68.08	2.15	8.87	-	27/04/22	12:07	-	68.50	2.19	9.05	-						
27/04/22	11:47	-	68.60	2.16	8.90	-	27/04/22	12:08	-	68.58	2.19	9.05	-						
27/04/22	11:48	-	67.70	2.15	8.84	-	27/04/22	12:09	-	68.19	2.19	8.81	-						
27/04/22	11:49	-	67.15	2.15	8.84	-	27/04/22	12:10	-	67.25	2.17	8.80	-						
27/04/22	11:50	-	67.43	2.17	8.83	-	27/04/22	12:11	-	67.25	2.15	8.91	-						
27/04/22	11:51	-	67.43	2.15	8.84	-	27/04/22	12:12	-	67.65	2.12	8.90	-						
27/04/22	11:52	-	67.45	2.05	8.90	-	27/04/22	12:13	-	67.25	2.15	8.90	-						
27/04/22	11:53	-	67.45	2.05	8.90	-	27/04/22	12:14	-	67.25	2.15	8.90	-						
27/04/22	11:54	-	67.65	2.23	8.95	-	27/04/22	12:15	-	67.65	2.15	8.87	-						
27/04/22	11:55	-	68.10	2.15	8.95	-	27/04/22	12:16	-	67.65	2.17	8.87	-						
Max		-	68.45	2.28	9.06	-	Max		-	69.65	2.23	9.06	-						
Avg		-	68.45	2.19	8.88	-	Avg		-	68.29	2.16	8.96	-						

Run No. 3	Time Base: 21 min						Run No. 4	Time Base: 21 min					
	Date	Time	502 ftm	NOL ftm	CO ftm	C02 Vol%		Date	Time	502 ftm	NOL ftm	CO ftm	C02 Vol%
27 Oct 22	12:17	-	6126	217	8.89	-	27 Oct 22	12:38	-	6750	214	9.06	-
27 Oct 22	12:18	-	6029	217	8.89	-	27 Oct 22	12:38	-	6400	216	8.90	-
27 Oct 22	12:19	-	6048	219	8.97	-	27 Oct 22	12:39	-	6300	216	8.90	-
27 Oct 22	12:20	-	6049	219	8.96	-	27 Oct 22	12:40	-	6300	216	8.90	-
27 Oct 22	12:21	-	6049	219	8.96	-	27 Oct 22	12:42	-	6538	217	8.90	-
27 Oct 22	12:22	-	6035	220	8.92	-	27 Oct 22	12:43	-	6458	216	8.85	-
27 Oct 22	12:23	-	6035	222	8.92	-	27 Oct 22	12:44	-	6458	216	8.85	-
27 Oct 22	12:24	-	6035	220	8.93	-	27 Oct 22	12:45	-	6440	220	8.81	-
27 Oct 22	12:25	-	6030	231	8.82	-	27 Oct 22	12:46	-	6440	221	8.81	-
27 Oct 22	12:26	-	6080	231	8.86	-	27 Oct 22	12:47	-	6405	227	8.89	-
27 Oct 22	12:27	-	6080	229	8.91	-	27 Oct 22	12:48	-	6405	227	8.89	-
27 Oct 22	12:28	-	6080	229	8.91	-	27 Oct 22	12:49	-	6405	227	8.89	-
27 Oct 22	12:29	-	6049	229	8.90	-	27 Oct 22	12:50	-	6405	227	8.89	-
27 Oct 22	12:30	-	6040	218	8.91	-	27 Oct 22	12:51	-	6389	231	8.92	-
27 Oct 22	12:31	-	6039	217	8.85	-	27 Oct 22	12:52	-	6389	230	8.89	-
27 Oct 22	12:32	-	6033	219	8.85	-	27 Oct 22	12:53	-	6389	233	8.91	-
27 Oct 22	12:33	-	6043	216	8.84	-	27 Oct 22	12:54	-	6010	230	8.90	-
27 Oct 22	12:34	-	6043	217	8.84	-	27 Oct 22	12:55	-	6010	230	8.90	-
27 Oct 22	12:35	-	6043	217	8.84	-	27 Oct 22	12:56	-	6010	230	8.90	-
27 Oct 22	12:36	-	6043	217	8.84	-	27 Oct 22	12:57	-	6010	230	8.90	-
27 Oct 22	12:37	-	6043	217	8.84	-	27 Oct 22	12:58	-	6010	230	8.90	-
27 Oct 22	12:37	-	6156	215	8.89	-	27 Oct 22	12:59	-	6010	230	8.90	-
Max Avg	-	-	6029	229	8.87	-	Max Avg	-	-	6010	233	8.91	-
			6035	233	8.89	-				5961	225	8.91	-

Run No.: 5	Time Base: 21 min									
	Date	Time	S02 ppm	NOx ppm	CO ppm	CO2 Vol%	O2 Vol%	O2 ppm	CO Vol%	NOx Vol%
	27/04/22	13:09	-	68.62	2.16	8.82	-	21.04	2.21	8.39
	27/04/22	13:20	-	68.16	2.20	8.81	-	20.95	2.23	8.39
	27/04/22	13:01	-	68.29	2.16	8.87	-	20.90	2.27	8.50
	27/04/22	13:07	-	67.59	2.17	8.88	-	20.90	2.25	8.68
	27/04/22	13:03	-	67.60	2.16	8.93	-	20.90	2.22	8.66
	27/04/22	13:04	-	68.00	2.14	8.93	-	20.94	2.20	8.66
	27/04/22	13:05	-	67.99	2.19	8.92	-	20.90	2.19	8.50
	27/04/22	13:06	-	68.00	2.14	8.88	-	20.90	2.19	8.50
	27/04/22	13:07	-	68.25	2.18	8.89	-	20.90	2.20	8.50
	27/04/22	13:08	-	68.40	2.16	8.90	-	20.90	2.19	8.50
	27/04/22	13:10	-	68.40	2.16	8.93	-	20.90	2.19	8.50
	27/04/22	13:11	-	68.20	2.19	8.93	-	20.90	2.15	8.89
	27/04/22	13:15	-	68.70	2.20	8.95	-	20.90	2.13	8.89
	27/04/22	13:12	-	68.60	2.20	8.97	-	20.90	2.13	8.93
	27/04/22	13:13	-	68.60	2.19	8.97	-	20.90	2.15	8.98
	27/04/22	13:14	-	68.70	2.22	8.93	-	20.90	2.16	8.92
	27/04/22	13:15	-	68.80	2.21	8.91	-	20.90	2.13	8.97
	27/04/22	13:16	-	68.70	2.21	8.96	-	20.90	2.15	8.92
	27/04/22	13:17	-	68.90	2.20	8.93	-	20.90	2.15	8.92
	27/04/22	13:18	-	68.90	2.20	8.93	-	20.90	2.16	8.95
	27/04/22	13:19	-	71.25	2.21	8.94	-	20.90	2.17	8.96
		Max		71.20	2.24	9.01		20.90	2.27	8.99
		Avg		68.16	2.19	8.93		20.90	2.23	8.92

Run No.: 6	Time Base: 21 min									
	Date	Time	S02 ppm	NOx ppm	CO ppm	CO2 Vol%	O2 Vol%	O2 ppm	CO Vol%	NOx Vol%
	27/04/22	13:20	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:21	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:22	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:23	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:24	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:25	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:26	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:27	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:28	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:29	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:30	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:31	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:32	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:33	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:34	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:35	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:36	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:37	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:38	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:39	-	67.60	2.21	8.92	-	21.04	2.21	8.39
	27/04/22	13:40	-	67.60	2.21	8.92	-	21.04	2.21	8.39
		Max		67.60	2.21	8.92		21.04	2.21	8.39
		Avg		67.60	2.21	8.92		21.04	2.21	8.39



Date 27 Oct 22
Location Styrene Furnace

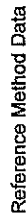
Date	27 Oct 22
Location	Styrene Furnace

Run No: 7		Time Base: 21 min					Run No: 8		Time Base: 21 min				
Date	Time	SQZ	MOs	CO	OZ	CO2	Date	Time	SQZ	MOs	CO	OZ	CO2
		perm	perm	perm	WPM	WPM			perm	perm	perm	WPM	WPM
27 Oct 22	13:41	-	68.20	2.14	8.31	-	27 Oct 22	14:02	-	68.20	2.14	8.31	-
27 Oct 22	13:42	-	68.20	2.14	8.31	-	27 Oct 22	14:03	-	68.20	2.14	8.31	-
27 Oct 22	13:43	-	68.20	2.14	8.31	-	27 Oct 22	14:04	-	68.20	2.14	8.31	-
27 Oct 22	13:44	-	68.20	2.14	8.31	-	27 Oct 22	14:05	-	68.20	2.14	8.31	-
27 Oct 22	13:45	-	68.20	2.14	8.31	-	27 Oct 22	14:06	-	68.20	2.14	8.31	-
27 Oct 22	13:46	-	68.20	2.14	8.31	-	27 Oct 22	14:07	-	68.20	2.14	8.31	-
27 Oct 22	13:47	-	68.20	2.14	8.31	-	27 Oct 22	14:08	-	68.20	2.14	8.31	-
27 Oct 22	13:48	-	70.20	2.20	8.50	-	27 Oct 22	14:09	-	68.20	2.14	8.31	-
27 Oct 22	13:49	-	70.20	2.20	8.50	-	27 Oct 22	14:10	-	68.20	2.14	8.31	-
27 Oct 22	13:50	-	70.20	2.20	8.50	-	27 Oct 22	14:11	-	68.20	2.14	8.31	-
27 Oct 22	13:51	-	70.20	2.20	8.50	-	27 Oct 22	14:12	-	68.20	2.14	8.31	-
27 Oct 22	13:52	-	70.20	2.20	8.50	-	27 Oct 22	14:13	-	68.20	2.14	8.31	-
27 Oct 22	13:53	-	70.20	2.20	8.50	-	27 Oct 22	14:14	-	68.20	2.20	8.50	-
27 Oct 22	13:54	-	70.20	2.20	8.50	-	27 Oct 22	14:15	-	68.20	2.20	8.50	-
27 Oct 22	13:55	-	70.20	2.20	8.50	-	27 Oct 22	14:16	-	68.20	2.17	8.31	-
27 Oct 22	13:56	-	70.20	2.23	8.50	-	27 Oct 22	14:17	-	68.20	2.17	8.31	-
27 Oct 22	13:57	-	70.20	2.23	8.50	-	27 Oct 22	14:18	-	70.40	2.23	8.30	-
27 Oct 22	13:58	-	68.60	2.27	8.50	-	27 Oct 22	14:19	-	70.40	2.14	8.31	-
27 Oct 22	13:59	-	70.60	2.33	8.50	-	27 Oct 22	14:20	-	70.20	2.22	8.50	-
27 Oct 22	14:00	-	68.10	2.14	8.31	-	27 Oct 22	14:21	-	70.20	2.20	8.50	-
27 Oct 22	14:01	-	68.70	2.18	8.31	-	27 Oct 22	14:22	-	70.60	2.20	8.31	-
Max		-	70.20	2.20	8.50	-	Max		-	70.60	2.24	8.54	-
Avg		-	68.84	2.20	8.34	-	Avg		-	69.37	2.18	8.44	-

Run No: 9							Time Base : 21 min							Run No: 10							Time Base : 21 min																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
Date	Time	502	NOx	CO	O2	CO2	Date	Time	502	NOx	CO	O2	CO2	Date	Time	502	NOx	CO	O2	CO2	Date	Time	502	NOx	CO	O2	CO2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
		ppm	ppm	ppm	%Vol	%Vol			ppm	ppm	ppm	%Vol	%Vol			ppm	ppm	ppm	%Vol	%Vol				ppm	ppm	ppm	%Vol	%Vol																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
27 Oct 22	14:23	-	78.68	2.19	8.91	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04	2.19	8.88	-	27 Oct 22	14:44	-	68.04

Run No: 12										Time Base: 21 min									
Date	Time	502 ftm	NOx ppm	CO ppm	CO2 Vol%	VOc Vol%	Date	Time	502 ftm	NOx ppm	CO ppm	CO2 Vol%	VOc Vol%						
27 Oct 12	15:05	-	70.50	2.21	8.91	-	27 Oct 12	15:16	-	70.70	2.19	8.84	-						
27 Oct 12	15:06	-	70.50	2.27	8.96	-	27 Oct 12	15:17	-	70.50	2.21	8.91	-						
27 Oct 12	15:07	-	70.50	2.21	8.99	-	27 Oct 12	15:18	-	71.00	2.31	9.00	-						
27 Oct 12	15:08	-	70.50	2.22	8.98	-	27 Oct 12	15:19	-	71.20	2.20	8.96	-						
27 Oct 12	15:09	-	70.50	2.19	8.99	-	27 Oct 12	15:20	-	70.80	2.22	8.98	-						
27 Oct 12	15:10	-	70.50	2.18	8.98	-	27 Oct 12	15:21	-	70.50	2.21	8.96	-						
27 Oct 12	15:11	-	70.50	2.18	8.98	-	27 Oct 12	15:22	-	70.90	2.24	8.99	-						
27 Oct 12	15:12	-	70.50	2.17	8.96	-	27 Oct 12	15:23	-	71.00	2.24	9.01	-						
27 Oct 12	15:13	-	69.50	2.17	8.94	-	27 Oct 12	15:24	-	71.10	2.22	8.98	-						
27 Oct 12	15:14	-	69.50	2.17	8.99	-	27 Oct 12	15:25	-	70.80	2.21	8.95	-						
27 Oct 12	15:15	-	69.10	2.16	9.07	-	27 Oct 12	15:26	-	70.30	2.18	8.90	-						
27 Oct 12	15:16	-	69.60	2.15	8.80	-	27 Oct 12	15:27	-	69.80	2.20	8.96	-						
27 Oct 12	15:17	-	69.10	2.12	9.02	-	27 Oct 12	15:28	-	69.40	2.16	8.90	-						
27 Oct 12	15:18	-	69.00	2.14	9.03	-	27 Oct 12	15:29	-	69.20	2.15	8.95	-						
27 Oct 12	15:19	-	69.10	2.14	9.03	-	27 Oct 12	15:30	-	67.10	2.16	8.91	-						
27 Oct 12	15:20	-	69.30	2.15	9.01	-	27 Oct 12	15:31	-	68.20	2.18	8.98	-						
27 Oct 12	15:21	-	69.30	2.17	8.95	-	27 Oct 12	15:32	-	68.20	2.16	8.92	-						
27 Oct 12	15:22	-	69.30	2.18	9.02	-	27 Oct 12	15:33	-	68.60	2.17	8.90	-						
27 Oct 12	15:23	-	70.50	2.18	9.02	-	27 Oct 12	15:34	-	71.30	2.24	9.01	-						
27 Oct 12	15:24	-	70.50	2.19	9.02	-	27 Oct 12	15:35	-	69.71	2.19	8.95	-						
Max	Aug	-	70.80	2.22	9.04	-	Max	Aug	-	71.30	2.24	9.01	-						
Avg		-	69.87	2.18	9.00	-	Avg		-	69.71	2.19	8.95	-						

Run No: 11										Time Base: 21 min									
Date	Time	502 ftm	NOx ppm	CO ppm	CO2 Vol%	VOc Vol%	Date	Time	502 ftm	NOx ppm	CO ppm	CO2 Vol%	VOc Vol%						
27 Oct 12	15:05	-	70.50	2.21	8.91	-	27 Oct 12	15:16	-	70.70	2.19	8.84	-						
27 Oct 12	15:06	-	70.50	2.27	8.96	-	27 Oct 12	15:17	-	70.50	2.21	8.91	-						
27 Oct 12	15:07	-	70.50	2.21	8.99	-	27 Oct 12	15:18	-	71.00	2.31	9.00	-						
27 Oct 12	15:08	-	70.50	2.22	8.98	-	27 Oct 12	15:19	-	71.20	2.20	8.96	-						
27 Oct 12	15:09	-	70.50	2.19	8.99	-	27 Oct 12	15:20	-	70.80	2.22	8.98	-						
27 Oct 12	15:10	-	70.50	2.18	8.98	-	27 Oct 12	15:21	-	70.50	2.21	8.96	-						
27 Oct 12	15:11	-	70.50	2.18	8.98	-	27 Oct 12	15:22	-	70.90	2.24	8.99	-						
27 Oct 12	15:12	-	70.50	2.17	8.96	-	27 Oct 12	15:23	-	71.00	2.24	9.01	-						
27 Oct 12	15:13	-	69.50	2.17	8.94	-	27 Oct 12	15:24	-	71.10	2.22	8.98	-						
27 Oct 12	15:14	-	69.50	2.17	8.99	-	27 Oct 12	15:25	-	70.80	2.21	8.95	-						
27 Oct 12	15:15	-	69.10	2.16	9.07	-	27 Oct 12	15:26	-	70.30	2.18	8.90	-						
27 Oct 12	15:16	-	69.60	2.15	8.80	-	27 Oct 12	15:27	-	69.80	2.20	8.96	-						
27 Oct 12	15:17	-	69.10	2.12	9.02	-	27 Oct 12	15:28	-	69.40	2.16	8.90	-						
27 Oct 12	15:18	-	69.00	2.14	9.03	-	27 Oct 12	15:29	-	69.20	2.15	8.95	-						
27 Oct 12	15:19	-	69.10	2.14	9.03	-	27 Oct 12	15:30	-	67.10	2.16	8.91	-						
27 Oct 12	15:20	-	69.30	2.15	9.01	-	27 Oct 12	15:31	-	68.20	2.18	8.98	-						
27 Oct 12	15:21	-	69.30	2.17	8.95	-	27 Oct 12	15:32	-	68.20	2.16	8.92	-						
27 Oct 12	15:22	-	69.30	2.18	9.02	-	27 Oct 12	15:33	-	68.60	2.17	8.90	-						
27 Oct 12	15:23	-	70.50	2.18	9.02	-	27 Oct 12	15:34	-	71.30	2.24	9.01	-						
27 Oct 12	15:24	-	70.50	2.19	9.02	-	27 Oct 12	15:35	-	69.71	2.19	8.95	-						
Max	Aug	-	70.80	2.22	9.04	-	Max	Aug	-	71.30	2.24	9.01	-						
Avg		-	69.87	2.18	9.00	-	Avg		-	69.71	2.19	8.95	-						



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Reference Method Data

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27 Oct 22
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Run No. 1	Time Base = 21 min										Time Base = 21 min									
	Date	Time	502 from	100% from	CO ppm	O ₂ ppm	CO ₂ Vol%	CO ppm	O ₂ ppm	CO ₂ Vol%	Date	Time	502 from	100% from	CO ppm	O ₂ ppm	CO ₂ Vol%			
Run No. 2	27-04-22	11:35	-	61.87	4.20	9.10	3.35	-	24.4	9.13	3.39	27-04-22	11:58	-	60.15	2.44	9.13	3.39		
	27-04-22	11:36	-	64.87	2.16	9.12	3.34	-	47.24	9.11	3.38	27-04-22	11:57	-	62.24	2.40	9.11	3.38		
	27-04-22	11:37	-	64.73	2.16	9.09	3.35	-	47.25	2.42	3.36	27-04-22	11:58	-	62.50	2.42	9.09	3.36		
	27-04-22	11:38	-	64.73	2.16	9.10	3.35	-	47.25	2.42	3.36	27-04-22	11:59	-	62.50	2.42	9.10	3.36		
	27-04-22	11:39	-	65.25	2.16	9.10	3.35	-	47.25	2.42	3.36	27-04-22	12:00	-	62.50	2.42	9.10	3.36		
	27-04-22	11:40	-	65.25	2.16	9.10	3.35	-	47.25	2.42	3.36	27-04-22	12:01	-	62.50	2.42	9.10	3.36		
	27-04-22	11:41	-	67.67	2.27	9.07	3.38	-	47.61	2.45	3.41	27-04-22	12:02	-	67.61	2.45	9.07	3.41		
	27-04-22	11:42	-	67.25	2.17	9.02	4.54	-	47.63	2.51	3.02	4.63	27-04-22	12:03	-	67.63	2.51	9.02	4.63	
	27-04-22	11:43	-	67.47	2.25	8.98	4.52	-	47.63	2.51	3.02	4.62	27-04-22	12:04	-	67.63	2.51	9.02	4.61	
	27-04-22	11:44	-	67.25	2.27	9.01	3.36	-	47.63	2.51	3.35	27-04-22	12:05	-	67.25	2.51	9.01	3.35		
	27-04-22	11:45	-	67.25	2.27	9.01	3.36	-	47.63	2.51	3.35	27-04-22	12:06	-	67.25	2.51	9.01	3.35		
	27-04-22	11:46	-	68.65	2.25	9.06	3.34	-	47.24	2.54	3.32	27-04-22	12:07	-	67.24	2.54	3.32	3.35		
	27-04-22	11:47	-	68.82	2.25	9.15	3.31	-	47.24	2.54	3.32	27-04-22	12:08	-	67.24	2.54	3.31	3.35		
	27-04-22	11:48	-	69.10	2.29	9.14	3.30	-	47.43	2.50	3.66	3.50	27-04-22	12:09	-	67.43	2.50	3.66	3.50	
27-04-22	11:49	-	68.21	2.28	9.05	3.39	-	47.43	2.51	3.62	4.05	27-04-22	12:10	-	68.28	2.51	3.62	4.05		
27-04-22	11:50	-	68.55	2.26	9.01	4.61	-	47.43	2.51	3.62	4.05	27-04-22	12:11	-	68.28	2.51	3.62	4.05		
27-04-22	11:51	-	67.97	2.23	9.02	4.61	-	47.43	2.51	3.62	4.05	27-04-22	12:12	-	67.97	2.51	3.62	4.05		
27-04-22	11:52	-	67.97	2.23	9.02	4.61	-	47.43	2.51	3.62	4.05	27-04-22	12:13	-	67.97	2.51	3.62	4.05		
27-04-22	11:53	-	67.97	2.23	9.02	4.61	-	47.43	2.51	3.62	4.05	27-04-22	12:14	-	67.97	2.51	3.62	4.05		
27-04-22	11:54	-	67.25	2.45	9.08	4.60	-	47.25	2.53	3.94	3.32	27-04-22	12:15	-	67.25	2.53	3.94	3.32		
27-04-22	11:55	-	67.25	2.45	9.08	4.60	-	47.25	2.53	3.94	3.32	27-04-22	12:16	-	67.25	2.53	3.94	3.32		
Max				69.21	2.43	9.15	4.54				4.59	Max			66.28	2.62	9.15	4.59		
Avg				64.13	2.27	9.06	3.38				3.59	Avg			67.68	2.59	9.13	3.59		

Run No: 3							Run No: 4							Run No: 5						
Time Base: 21 min							Time Base: 21 min							Time Base: 21 min						
Date	Time	502 gpm	NO _x ppm	CO ppm	O ₂ %	CO2 Vol%	Date	Time	502 gpm	NO _x ppm	CO ppm	O ₂ %	CO2 Vol%	Date	Time	502 gpm	NO _x ppm	CO ppm	O ₂ %	CO2 Vol%
27 Oct 22	12:17	-	67.06	2.56	9.23	4.04	27 Oct 22	12:35	-	68.23	2.72	9.62	4.01	27 Oct 22	12:53	-	68.23	2.72	9.62	4.01
27 Oct 22	12:18	-	67.26	2.56	9.23	4.04	27 Oct 22	12:36	-	68.23	2.72	9.62	4.01	27 Oct 22	12:54	-	68.23	2.72	9.62	4.01
27 Oct 22	12:19	-	67.26	2.56	9.23	4.04	27 Oct 22	12:37	-	68.23	2.72	9.62	4.01	27 Oct 22	12:55	-	68.23	2.72	9.62	4.01
27 Oct 22	12:20	-	67.26	2.56	9.23	4.04	27 Oct 22	12:38	-	68.23	2.72	9.62	4.01	27 Oct 22	12:56	-	68.23	2.72	9.62	4.01
27 Oct 22	12:21	-	67.26	2.56	9.23	4.04	27 Oct 22	12:39	-	68.23	2.72	9.62	4.01	27 Oct 22	12:57	-	68.23	2.72	9.62	4.01
27 Oct 22	12:22	-	67.26	2.56	9.23	4.04	27 Oct 22	12:40	-	68.23	2.72	9.62	4.01	27 Oct 22	12:58	-	68.23	2.72	9.62	4.01
27 Oct 22	12:23	-	67.26	2.56	9.23	4.04	27 Oct 22	12:41	-	68.23	2.72	9.62	4.01	27 Oct 22	12:59	-	68.23	2.72	9.62	4.01
27 Oct 22	12:24	-	67.26	2.56	9.23	4.04	27 Oct 22	12:42	-	68.23	2.72	9.62	4.01	27 Oct 22	13:00	-	68.23	2.72	9.62	4.01
27 Oct 22	12:25	-	67.26	2.56	9.23	4.04	27 Oct 22	12:43	-	68.23	2.72	9.62	4.01	27 Oct 22	13:01	-	68.23	2.72	9.62	4.01
27 Oct 22	12:26	-	67.26	2.56	9.23	4.04	27 Oct 22	12:44	-	68.23	2.72	9.62	4.01	27 Oct 22	13:02	-	68.23	2.72	9.62	4.01
27 Oct 22	12:27	-	67.26	2.56	9.23	4.04	27 Oct 22	12:45	-	68.23	2.72	9.62	4.01	27 Oct 22	13:03	-	68.23	2.72	9.62	4.01
27 Oct 22	12:28	-	67.26	2.56	9.23	4.04	27 Oct 22	12:46	-	68.23	2.72	9.62	4.01	27 Oct 22	13:04	-	68.23	2.72	9.62	4.01
27 Oct 22	12:29	-	67.26	2.56	9.23	4.04	27 Oct 22	12:47	-	68.23	2.72	9.62	4.01	27 Oct 22	13:05	-	68.23	2.72	9.62	4.01
27 Oct 22	12:30	-	67.26	2.56	9.23	4.04	27 Oct 22	12:48	-	68.23	2.72	9.62	4.01	27 Oct 22	13:06	-	68.23	2.72	9.62	4.01
27 Oct 22	12:31	-	67.26	2.56	9.23	4.04	27 Oct 22	12:49	-	68.23	2.72	9.62	4.01	27 Oct 22	13:07	-	68.23	2.72	9.62	4.01
27 Oct 22	12:32	-	67.26	2.56	9.23	4.04	27 Oct 22	12:50	-	68.23	2.72	9.62	4.01	27 Oct 22	13:08	-	68.23	2.72	9.62	4.01
27 Oct 22	12:33	-	67.26	2.56	9.23	4.04	27 Oct 22	12:51	-	68.23	2.72	9.62	4.01	27 Oct 22	13:09	-	68.23	2.72	9.62	4.01
27 Oct 22	12:34	-	67.26	2.56	9.23	4.04	27 Oct 22	12:52	-	68.23	2.72	9.62	4.01	27 Oct 22	13:10	-	68.23	2.72	9.62	4.01
27 Oct 22	12:35	-	67.26	2.56	9.23	4.04	27 Oct 22	12:53	-	68.23	2.72	9.62	4.01	27 Oct 22	13:11	-	68.23	2.72	9.62	4.01
27 Oct 22	12:36	-	67.26	2.56	9.23	4.04	27 Oct 22	12:54	-	68.23	2.72	9.62	4.01	27 Oct 22	13:12	-	68.23	2.72	9.62	4.01
27 Oct 22	12:37	-	67.26	2.56	9.23	4.04	27 Oct 22	12:55	-	68.23	2.72	9.62	4.01	27 Oct 22	13:13	-	68.23	2.72	9.62	4.01
27 Oct 22	12:38	-	67.26	2.56	9.23	4.04	27 Oct 22	12:56	-	68.23	2.72	9.62	4.01	27 Oct 22	13:14	-	68.23	2.72	9.62	4.01
27 Oct 22	12:39	-	67.26	2.56	9.23	4.04	27 Oct 22	12:57	-	68.23	2.72	9.62	4.01	27 Oct 22	13:15	-	68.23	2.72	9.62	4.01
27 Oct 22	12:40	-	67.26	2.56	9.23	4.04	27 Oct 22	12:58	-	68.23	2.72	9.62	4.01	27 Oct 22	13:16	-	68.23	2.72	9.62	4.01
27 Oct 22	12:41	-	67.26	2.56	9.23	4.04	27 Oct 22	12:59	-	68.23	2.72	9.62	4.01	27 Oct 22	13:17	-	68.23	2.72	9.62	4.01
27 Oct 22	12:42	-	67.26	2.56	9.23	4.04	27 Oct 22	13:00	-	68.23	2.72	9.62	4.01	27 Oct 22	13:18	-	68.23	2.72	9.62	4.01
27 Oct 22	12:43	-	67.26	2.56	9.23	4.04	27 Oct 22	13:01	-	68.23	2.72	9.62	4.01	27 Oct 22	13:19	-	68.23	2.72	9.62	4.01
27 Oct 22	12:44	-	67.26	2.56	9.23	4.04	27 Oct 22	13:02	-	68.23	2.72	9.62	4.01	27 Oct 22	13:20	-	68.23	2.72	9.62	4.01
27 Oct 22	12:45	-	67.26	2.56	9.23	4.04	27 Oct 22	13:03	-	68.23	2.72	9.62	4.01	27 Oct 22	13:21	-	68.23	2.72	9.62	4.01
27 Oct 22	12:46	-	67.26	2.56	9.23	4.04	27 Oct 22	13:04	-	68.23	2.72	9.62	4.01	27 Oct 22	13:22	-	68.23	2.72	9.62	4.01
27 Oct 22	12:47	-	67.26	2.56	9.23	4.04	27 Oct 22	13:05	-	68.23	2.72	9.62	4.01	27 Oct 22	13:23	-	68.23	2.72	9.62	4.01
27 Oct 22	12:48	-	67.26	2.56	9.23	4.04	27 Oct 22	13:06	-	68.23	2.72	9.62	4.01	27 Oct 22	13:24	-	68.23	2.72	9.62	4.01
27 Oct 22	12:49	-	67.26	2.56	9.23	4.04	27 Oct 22	13:07	-	68.23	2.72	9.62	4.01	27 Oct 22	13:25	-	68.23	2.72	9.62	4.01
27 Oct 22	12:50	-	67.26	2.56	9.23	4.04	27 Oct 22	13:08	-	68.23	2.72	9.62	4.01	27 Oct 22	13:26	-	68.23	2.72	9.62	4.01
27 Oct 22	12:51	-	67.26	2.56	9.23	4.04	27 Oct 22	13:09	-	68.23	2.72	9.62	4.01	27 Oct 22	13:27	-	68.23	2.72	9.62	4.01
27 Oct 22	12:52	-	67.26	2.56	9.23	4.04	27 Oct 22	13:10	-	68.23	2.72	9.62	4.01	27 Oct 22	13:28	-	68.23	2.72	9.62	4.01
27 Oct 22	12:53	-	67.26	2.56	9.23	4.04	27 Oct 22	13:11	-	68.23	2.72	9.62	4.01	27 Oct 22	13:29	-	68.23	2.72	9.62	4.01
27 Oct 22	12:54	-	67.26	2.56	9.23	4.04	27 Oct 22	13:12	-	68.23	2.72	9.62	4.01	27 Oct 22	13:30	-	68.23	2.72	9.62	4.01
27 Oct 22	12:55	-	67.26	2.56	9.23	4.04	27 Oct 22	13:13	-	68.23	2.72	9.62	4.01	27 Oct 22	13:31	-	68.23	2.72	9.62	4.01
27 Oct 22	12:56	-	67.26	2.56	9.23	4.04	27 Oct 22	13:14	-	68.23	2.72	9.62	4.01	27 Oct 22	13:32	-	68.23	2.72	9.62	4.01
27 Oct 22	12:57	-	67.26	2.56	9.23	4.04	27 Oct 22	13:15	-	68.23	2.72	9.62	4.01	27 Oct 22	13:33	-	68.23	2.72	9.62	4.01
27 Oct 22	12:58	-	67.26	2.56	9.23	4.04	27 Oct 22	13:16	-	68.23	2.72	9.62	4.01	27 Oct 22	13:34	-	68.23	2.72	9.62	4.01
27 Oct 22	12:59	-	67.26	2.56	9.23	4.04	27 Oct 22	13:17	-	68.23	2.72	9.62	4.01	27 Oct 22	13:35	-	68.23	2.72	9.62	4.01
27 Oct 22	13:00	-	67.26	2.56	9.23	4.04	27 Oct 22	13:18	-	68.23	2.72	9.62	4.01	27 Oct 22	13:36	-	68.23	2.72	9.62	4.01
27 Oct 22	13:01	-	67.26	2.56	9.23	4.04	27 Oct 22	13:19	-	68.23	2.72	9.62	4.01	27 Oct 22	13:37	-	68.23	2.72	9.62	4.01
27 Oct 22	13:02	-	67.26	2.56	9.23	4.04	27 Oct 22	13:20	-	68.23	2.72	9.62	4.01	27 Oct 22	13:38	-	68.23	2.72	9.62	4.01
27 Oct 22	13:03	-	67.26	2.56	9.23	4.04	27 Oct 22	13:21	-	68.23	2.72	9.62	4.01	27 Oct 22	13:39	-	68.23	2.72	9.62	4.01
27 Oct 22	13:04	-	67.26	2.56	9.23	4.04	27 Oct 22	13:22	-	68.23	2.72	9.62	4.01	27 Oct 22	13:40	-	68.23	2.72	9.62	4.01
27 Oct 22	13:05	-	67.26	2.56	9.23	4.04	27 Oct 22	13:23	-	68.23	2.72	9.62	4.01	27 Oct 22	13:41	-	68.23	2.72	9.62	4.01
27 Oct 22	13:06	-	67.26	2.56	9.23	4.04	27 Oct 22	13:24	-	68.23	2.72	9.62	4.01	27 Oct 22	13:42	-	68.23	2.72	9.62	4.01
27 Oct 22	13:07	-	67.26	2.56	9.23	4.04	27 Oct 22	13:25	-	68.23	2.72	9.62	4.01	27 Oct 22	13:43	-	68.23	2.72	9.62	4.01
27 Oct 22	13:08	-	67.26	2.56	9.23	4.04	27 Oct 22	13:26	-	68.23	2.72	9.62	4.01	27 Oct 22	13:44	-	68.23	2.72	9.62	4.01
27 Oct 22	13:09	-	67.26	2.56	9.23	4.04	27 Oct 22	13:27	-	68.23	2.72	9.62	4.01	27 Oct 22	13:45	-	68.23	2.72	9.62	4.01
27 Oct 22	13:10	-	67.26	2.56	9.23	4.04	27 Oct 22	13:28	-	68.23	2.72	9.62	4.01	27 Oct 22	13:46	-	68.23	2.72	9.62	4.01
27 Oct 22	13:11	-	67.26	2.56	9.23	4.04	27 Oct 22	13:29	-	68.23	2.72	9.62	4.01	27 Oct 22	13:47	-	68.23	2.72	9.62	4.01
27 Oct 22	13:12	-	67.26	2.56	9.23	4.04	27 Oct 22	13:30	-	68.23	2.72	9.62	4.01	27 Oct 22	13:48	-	68.23	2.72	9.62	4.01
27 Oct 22	13:13	-	67.26	2.56	9.23	4.04	27 Oct 22	13:31	-	68.23	2.72	9.62	4.01	27 Oct 22	13:49	-	68.23	2.72	9.62	4.01
27 Oct 22	13:14	-	67.26	2.56	9.23	4.04	27 Oct 22	13:32	-	68.23	2.72	9.62	4.01	27 Oct 22	13:50	-	68.23	2.72	9.62	4.01
27 Oct 22	13:15	-	67.26	2.56	9.23	4.04	27 Oct 22	13:33	-	68.23	2.72	9.62	4.01	27 Oct 22	13:51	-	68.23	2.72	9.62	4.01
27 Oct 22	13:16	-	67.26	2.56	9.23	4.04	27 Oct 22	13:34	-	68.23	2.72	9.62	4.01	27 Oct 22	13:52	-	68.23	2.72	9.62	4.01
27 Oct 22	13:17	-	67.26	2.56	9.23	4.04	27 Oct 22	13:35	-	68.23	2.72	9.62	4.01	27 Oct 22	13:53	-	68.23	2.72	9.62	4.01
27 Oct 22	13:18	-	67.26	2.56	9.23	4.04	27 Oct 22	13:36	-	68.23	2.72	9.62	4.01	27 Oct 22	13:54	-	68.23	2.72	9.62	4.01
27 Oct 22	13:19	-	67.26	2.56	9.23	4.04	27 Oct 22	13:37	-	68.23										

[illegible]

Data location

Reference Method Data

Data location

7 Oct 22
Bene Furnace

11

Run No. 7										Run No. 8										Run No. 9									
Time Base: 21 min					Time Base: 21 min					Time Base: 21 min					Time Base: 21 min					Time Base: 21 min									
Date	Time	502	N0x	CO	Date	Time	502	N0x	CO	Date	Time	502	N0x	CO	Date	Time	502	N0x	CO	Date	Time	502	N0x	CO					
		pphm	pphm	pphm			pphm	pphm	pphm			pphm	pphm	pphm			pphm	pphm	pphm			pphm	pphm	pphm					
27 Oct 22	13:41	-	66.39	2.87	27 Oct 22	14:02	-	66.40	3.05	27 Oct 22	14:02	-	66.40	3.05	27 Oct 22	14:02	-	66.38	3.05	27 Oct 22	14:02	-	66.38	3.05					
27 Oct 22	13:42	-	66.87	3.09	27 Oct 22	14:03	-	66.36	3.11	27 Oct 22	14:03	-	66.36	3.11	27 Oct 22	14:03	-	66.36	3.11	27 Oct 22	14:03	-	66.36	3.11					
27 Oct 22	13:43	-	66.39	2.92	27 Oct 22	14:04	-	66.39	3.12	27 Oct 22	14:04	-	66.39	3.12	27 Oct 22	14:04	-	66.39	3.12	27 Oct 22	14:04	-	66.39	3.12					
27 Oct 22	13:44	-	66.39	3.09	27 Oct 22	14:05	-	66.39	3.11	27 Oct 22	14:05	-	66.39	3.11	27 Oct 22	14:05	-	66.39	3.11	27 Oct 22	14:05	-	66.39	3.11					
27 Oct 22	13:45	-	66.43	3.01	27 Oct 22	14:06	-	66.43	3.06	27 Oct 22	14:06	-	66.43	3.06	27 Oct 22	14:06	-	66.43	3.06	27 Oct 22	14:06	-	66.43	3.06					
27 Oct 22	13:46	-	66.43	3.11	27 Oct 22	14:07	-	66.43	3.11	27 Oct 22	14:07	-	66.43	3.11	27 Oct 22	14:07	-	66.43	3.11	27 Oct 22	14:07	-	66.43	3.11					
27 Oct 22	13:47	-	66.37	3.02	27 Oct 22	14:08	-	66.37	3.09	27 Oct 22	14:08	-	66.37	3.09	27 Oct 22	14:08	-	66.37	3.09	27 Oct 22	14:08	-	66.37	3.09					
27 Oct 22	13:48	-	66.58	2.95	27 Oct 22	14:09	-	66.37	3.17	27 Oct 22	14:09	-	66.37	3.17	27 Oct 22	14:09	-	66.37	3.17	27 Oct 22	14:09	-	66.37	3.17					
27 Oct 22	13:49	-	66.34	2.99	27 Oct 22	14:10	-	66.39	3.10	27 Oct 22	14:10	-	66.39	3.10	27 Oct 22	14:10	-	66.39	3.10	27 Oct 22	14:10	-	66.39	3.10					
27 Oct 22	13:50	-	66.53	2.98	27 Oct 22	14:11	-	66.37	3.15	27 Oct 22	14:11	-	66.37	3.15	27 Oct 22	14:11	-	66.37	3.15	27 Oct 22	14:11	-	66.37	3.15					
27 Oct 22	13:51	-	66.32	3.12	27 Oct 22	14:12	-	66.32	3.15	27 Oct 22	14:12	-	66.32	3.15	27 Oct 22	14:12	-	66.32	3.15	27 Oct 22	14:12	-	66.32	3.15					
27 Oct 22	13:52	-	66.33	3.07	27 Oct 22	14:13	-	66.33	3.07	27 Oct 22	14:13	-	66.33	3.07	27 Oct 22	14:13	-	66.33	3.07	27 Oct 22	14:13	-	66.33	3.07					
27 Oct 22	13:53	-	66.33	3.04	27 Oct 22	14:14	-	66.36	3.14	27 Oct 22	14:14	-	66.36	3.14	27 Oct 22	14:14	-	66.36	3.14	27 Oct 22	14:14	-	66.36	3.14					
27 Oct 22	13:54	-	66.15	3.03	27 Oct 22	14:15	-	66.15	3.05	27 Oct 22	14:15	-	66.15	3.05	27 Oct 22	14:15	-	66.15	3.05	27 Oct 22	14:15	-	66.15	3.05					
27 Oct 22	13:55	-	66.20	3.04	27 Oct 22	14:16	-	66.38	3.14	27 Oct 22	14:16	-	66.38	3.14	27 Oct 22	14:16	-	66.38	3.14	27 Oct 22	14:16	-	66.38	3.14					
27 Oct 22	13:56	-	66.23	3.03	27 Oct 22	14:17	-	66.58	3.07	27 Oct 22	14:17	-	66.58	3.07	27 Oct 22	14:17	-	66.58	3.07	27 Oct 22	14:17	-	66.58	3.07					
27 Oct 22	13:57	-	66.33	3.09	27 Oct 22	14:18	-	66.33	3.09	27 Oct 22	14:18	-	66.33	3.09	27 Oct 22	14:18	-	66.33	3.09	27 Oct 22	14:18	-	66.33	3.09					
27 Oct 22	13:58	-	66.34	3.08	27 Oct 22	14:19	-	66.34	3.08	27 Oct 22	14:19	-	66.34	3.08	27 Oct 22	14:19	-	66.34	3.08	27 Oct 22	14:19	-	66.34	3.08					
27 Oct 22	13:59	-	66.34	3.02	27 Oct 22	14:20	-	66.34	3.02	27 Oct 22	14:20	-	66.34	3.02	27 Oct 22	14:20	-	66.34	3.02	27 Oct 22	14:20	-	66.34	3.02					
27 Oct 22	14:00	-	66.55	3.01	27 Oct 22	14:21	-	66.55	3.01	27 Oct 22	14:21	-	66.55	3.01	27 Oct 22	14:21	-	66.55	3.01	27 Oct 22	14:21	-	66.55	3.01					
27 Oct 22	14:01	-	66.71	3.13	27 Oct 22	14:22	-	66.71	3.13	27 Oct 22	14:22	-	66.71	3.13	27 Oct 22	14:22	-	66.71	3.13	27 Oct 22	14:22	-	66.71	3.13					
	Max		66.23	3.13		Max		66.58	3.14		Max		66.58	3.14		Max		66.58	3.14		Max		66.58	3.14					
	Avg		66.33	3.01		Avg		66.34	3.06		Avg		66.34	3.06		Avg		66.34	3.06		Avg		66.34	3.06					

Run No. 9	Time Base : 21 min						Time Base : 21 min						
	Date	Time	SIG dBm	60% dBm	CO dBm	SNR dB	Date	Time	SIG dBm	60% dBm	CO dBm	SNR dB	
	27/04/22	14:23	-	69.15	3.16	9.10	3.96	27/04/22	14:44	-	69.54	3.95	
	27/04/22	14:24	-	69.16	3.16	9.10	3.96	27/04/22	14:45	-	69.46	3.95	
	27/04/22	14:25	-	69.42	3.05	9.09	3.55	27/04/22	14:46	-	69.25	3.92	
	27/04/22	14:26	-	69.42	3.16	9.08	3.97	27/04/22	14:47	-	69.25	3.92	
	27/04/22	14:27	-	69.44	3.21	9.07	3.59	27/04/22	14:48	-	69.41	3.95	
	27/04/22	14:28	-	69.50	3.17	9.08	3.58	27/04/22	14:49	-	69.31	3.94	
	27/04/22	14:29	-	69.39	3.14	9.05	3.58	27/04/22	14:50	-	69.19	3.97	
	27/04/22	14:30	-	69.24	3.17	9.05	3.50	27/04/22	14:51	-	69.27	3.94	
	27/04/22	14:31	-	69.24	3.17	9.05	3.50	27/04/22	14:52	-	69.41	3.97	
	27/04/22	14:32	-	69.25	3.08	9.11	3.55	27/04/22	14:53	-	69.44	3.97	
	27/04/22	14:33	-	69.32	3.07	9.09	3.59	27/04/22	14:54	-	69.51	3.95	
	27/04/22	14:34	-	69.32	3.10	9.08	3.95	27/04/22	14:55	-	69.54	3.95	
	27/04/22	14:35	-	69.24	3.14	9.07	3.89	27/04/22	14:56	-	69.71	3.91	
	27/04/22	14:36	-	69.24	3.04	9.05	3.95	27/04/22	14:57	-	69.43	3.94	
	27/04/22	14:37	-	69.28	3.14	9.03	3.87	27/04/22	14:58	-	69.43	3.94	
	27/04/22	14:38	-	69.28	3.14	9.03	3.87	27/04/22	14:59	-	69.55	3.99	
	27/04/22	14:39	-	69.45	3.21	9.06	3.95	27/04/22	15:00	-	69.25	3.97	
	27/04/22	14:40	-	69.45	3.21	9.06	3.95	27/04/22	15:01	-	69.68	3.98	
	27/04/22	14:41	-	69.51	3.13	9.08	3.97	27/04/22	15:02	-	69.67	3.98	
	27/04/22	14:42	-	69.50	3.13	9.08	3.97	27/04/22	15:03	-	69.31	3.97	
	27/04/22	14:43	-	69.52	3.05	9.05	3.98	27/04/22	15:04	-	69.25	3.97	
	27/04/22	14:44	-	69.12	2.16	8.09	3.32	27/04/22	15:05	-	69.75	3.99	
	27/04/22	14:45	-	69.41	3.15	9.07	3.99	27/04/22	15:06	-	70.04	4.01	
		Max	-	93.65	3.21	9.13	3.59			Max	-	70.04	4.01
		Avg	-	89.65	3.14	9.07	3.89			Avg	-	69.42	3.95

Run No: 11		Time Base: 21 min					Run No: 12					Time Base: 21 min				
Date	Time	SO2	NOx	CO	Q1	CO2	Date	Time	SO2	NOx	CO	Q1	CO2			
		ppm	ppm	ppm	Wt%	Wt%			ppm	ppm	ppm	Wt%	Wt%			
27 Oct 22	15:05	-	69.82	3.19	5.07	3.08	27 Oct 22	15:05	-	69.38	3.15	5.12	3.84			
27 Oct 22	15:06	-	69.82	3.21	5.10	3.05	27 Oct 22	15:07	-	69.50	3.19	5.12	3.97			
27 Oct 22	15:07	-	69.82	3.17	5.07	3.09	27 Oct 22	15:08	-	69.50	3.19	5.12	3.97			
27 Oct 22	15:08	-	69.82	3.17	5.07	3.09	27 Oct 22	15:09	-	69.39	3.18	5.08	3.95			
27 Oct 22	15:09	-	69.81	3.18	5.12	3.15	27 Oct 22	15:10	-	69.40	3.20	5.05	3.95			
27 Oct 22	15:10	-	69.56	3.16	5.11	3.34	27 Oct 22	15:11	-	69.65	3.22	5.11	3.87			
27 Oct 22	15:11	-	69.62	3.18	5.09	4.01	27 Oct 22	15:12	-	69.62	3.24	5.11	3.92			
27 Oct 22	15:12	-	69.32	3.15	5.10	3.91	27 Oct 22	15:13	-	69.25	3.25	5.09	3.86			
27 Oct 22	15:13	-	70.23	3.16	5.08	3.95	27 Oct 22	15:14	-	69.36	3.25	5.09	3.86			
27 Oct 22	15:14	-	70.03	3.17	5.11	3.93	27 Oct 22	15:15	-	69.36	3.25	5.09	3.86			
27 Oct 22	15:15	-	70.03	3.17	5.11	3.93	27 Oct 22	15:16	-	69.60	3.21	5.13	3.95			
27 Oct 22	15:16	-	69.35	3.14	5.13	3.88	27 Oct 22	15:17	-	69.86	3.23	5.07	3.97			
27 Oct 22	15:17	-	69.34	3.21	5.12	3.95	27 Oct 22	15:18	-	69.53	3.21	5.05	4.05			
27 Oct 22	15:18	-	69.60	3.20	5.10	3.88	27 Oct 22	15:19	-	69.38	3.21	5.04	3.95			
27 Oct 22	15:19	-	69.69	3.22	5.11	3.86	27 Oct 22	15:20	-	69.25	3.19	5.00	3.93			
27 Oct 22	15:20	-	69.41	3.18	5.10	3.89	27 Oct 22	15:21	-	69.41	3.23	5.08	3.91			
27 Oct 22	15:21	-	69.41	3.18	5.10	3.89	27 Oct 22	15:22	-	69.41	3.23	5.08	3.91			
27 Oct 22	15:22	-	69.35	3.16	5.12	3.91	27 Oct 22	15:23	-	69.43	3.26	5.04	3.89			
27 Oct 22	15:23	-	69.48	3.21	5.12	4.01	27 Oct 22	15:24	-	67.45	3.22	5.04	3.98			
27 Oct 22	15:24	-	69.70	3.16	5.08	3.93	27 Oct 22	15:25	-	67.54	3.21	5.02	3.95			
27 Oct 22	15:25	-	69.81	3.20	5.13	3.84	27 Oct 22	15:46	-	67.72	3.29	5.04	3.95			
Max		-	70.23	3.22	5.13	4.01	Max		-	69.66	3.25	5.12	4.01			
Avg		-	69.55	3.18	5.10	3.95	Avg		-	69.68	3.20	5.07	3.86			



an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
6141 Easton Road
Bldg 2
Plumsteadville, PA 19049
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E04N199E15A0440
Cylinder Number: EB0140237
Laboratory: 124 - Plumsteadville - PA
PGVP Number: A12020
Gas Code: CO,NO,NOX,SO2,BALN
Reference Number: 160-401977167-1
Cylinder Volume: 144.4 CF
Cylinder Pressure: 2015 PSIG
Valve Outlet: 660
Certification Date: Dec 23, 2020
Expiration Date: Dec 23, 2028

Certification performed in accordance with EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2013) document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction factors. 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
NOX	80.00 PPM	79.42 PPM	G1	+/- 1.1% NIST Traceable
CARBON MONOXIDE	80.00 PPM	80.16 PPM	G1	+/- 0.5% NIST Traceable
NITRIC OXIDE	80.00 PPM	79.41 PPM	G1	+/- 1.1% NIST Traceable
SULFUR DIOXIDE	80.00 PPM	80.22 PPM	G1	+/- 1.1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	11010130	KAL004536	97.31 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%
PRM	12386	D685025	9.91 PPM AIR/NITROGEN DIOXIDE	2.0%
NTRM	17080228	EB0079109	100.3 PPM NITRIC OXIDE/NITROGEN	+/- 1.0%
GMIS	124206889	CC323707	4.028 PPM NITROGEN DIOXIDE/NITROGEN	2.1%
NTRM	16010203	KAL003087	97.89 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%
The SRM, PRM or RQM 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 iSS50 FTIR AUP2010245 CO	FTIR	Dec 10, 2020
Nicolet iSS50 FTIR AUP2010245 NO	FTIR	Dec 16, 2020
Nicolet iSS50 FTIR AUP2010245 NO2	FTIR	Dec 02, 2020

Triad Data Available Upon Request

NOTES:
Gross Weight: 27.8 Kg
Net Weight: 4.7 Kg



Michael A. Mader
Approved for Release

Airgas Specialty Gases
Airgas USA, LLC
6141 Easton Road
Bldg 2
Plumsteadville, PA 19049
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E04N199E15A021C
Cylinder Number: GC709609
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 2013) document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction factors. 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
NOX	55.00 PPM	54.96 PPM	G1	+/- 1.4% NIST Traceable
CARBON MONOXIDE	55.00 PPM	54.84 PPM	G1	+/- 0.7% NIST Traceable
NITRIC OXIDE	55.00 PPM	54.69 PPM	G1	+/- 1.1% NIST Traceable
SULFUR DIOXIDE	55.00 PPM	55.55 PPM	G1	+/- 1.0% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	14060753	CC434455	49.88 PPM CARBON MONOXIDE/NITROGEN	+/- 0.8%
PRM	12386	D685025	9.91 PPM AIR/NITROGEN DIOXIDE	2.0%
NTRM	200611-04	GC707968	49.82 PPM NITRIC OXIDE/NITROGEN	+/- 1.0%
GMIS	124206889	CC323707	4.028 PPM NITROGEN DIOXIDE/NITROGEN	2.1%
NTRM	0141709	KAL003190	49.67 PPM SULFUR DIOXIDE/NITROGEN	+/- 1.0%
The SRM, PRM or RQM 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 iSS50 FTIR AUP2010245 CO	FTIR	Feb 04, 2021
Nicolet iSS50 FTIR AUP2010245 NO	FTIR	Feb 11, 2021
Nicolet iSS50 FTIR AUP2010245 NO2	FTIR	Feb 22, 2021

Triad Data Available Upon Request

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



Michael A. Mader
Approved for Release



Airgas Specialty Gases
Airgas USA, LLC
6441 Easton Road
P.O. Box 100
Plumsteadville, PA 19349
Airgas.com



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Airgas USA, LLC
6441 Easton Road
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Plumsteadville, PA 19349
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E04N199E15A0440
Cylinder Number: E04N199E15A0440
Laboratory: 124 - Plumsteadville - PA
PGVP Number: A12020
Gas Code: CO, NO, NOX, SO₂, BALN

Reference Number: 82-401123185-1
Cylinder Volume: 247.2 CF
Valve Pressure: 2215 PSIG
Valve Outlet: 660
Certification Date: Feb 28, 2018

Expiration Date: Feb 28, 2028

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/021, using the assay procedures and methods described therein. This certificate is valid only for the use of this calibration mixture. All concentrations are on a molar basis unless otherwise noted.

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

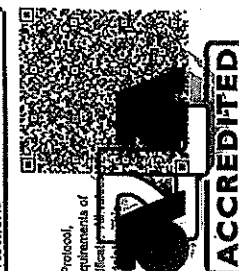
ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty	Assay Dates
NOX	80.00 PPM	80.27 PPM	+/- 1.4% NIST Traceable	09/29/2020, 10/06/2020
CARBON MONOXIDE	80.00 PPM	80.53 PPM	+/- 1.0% NIST Traceable	09/29/2020
NITRIC OXIDE	80.00 PPM	80.27 PPM	+/- 1.4% NIST Traceable	09/29/2020, 10/06/2020
SULFUR DIOXIDE	80.00 PPM	79.00 PPM	+/- 1.0% NIST Traceable	09/29/2020, 10/06/2020
NITROGEN	Balance			

CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	11010130	KAL004536	97.31 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%
PRM	12386	D85025	9.91 PPM ARGININE/NITROGEN	+/- 0.4%
NTRM	17060226	E00079109	100.3 PPM NITRIC OXIDE/NITROGEN	+/- 1.0%
GNIS	12403689	C0323707	4.028 PPM NITROGEN DIOXIDE/NITROGEN	+/- 1.0%
NTRM	07060227	E00079116	100.6 PPM NITROGEN	+/- 1.0%
NTRM	16010235	KAL004419	97.69 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%
NTRM	11010416	KAL004802	99.6 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%

ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration		
Nicolet 8700 FTIR AUP2010245 CO	FTIR	Sep 21, 2020		
Nicolet 8700 FTIR AUP2010245 NO	FTIR	Sep 14, 2020		
Nicolet 8700 FTIR AUP2010245 NO2	FTIR	Sep 22, 2020		
Nicolet 8700 FTIR AUP2010245 SO2	FTIR	Sep 16, 2020		

Triad Data Available Upon Request

NOTE: This calibration std. has been certified in accordance with the May 2012 EPA Traceability Protocol, document EPA-600/R-12/021. All testing processes and measurements conform to the requirements of ISO/IEC 17025 and to Airgas ISO 9001:2000 and relate only to items identified on this certificate. All other 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.



Approved for Release



Airgas Specialty Gases
Airgas USA, LLC
6441 Easton Road
P.O. Box 100
Plumsteadville, PA 19349
Airgas.com



Airgas Specialty Gases
Airgas USA, LLC
6441 Easton Road
P.O. Box 100
Plumsteadville, PA 19349
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E04N199E15A0440
Cylinder Number: E04N199E15A0440
Laboratory: 124 - Plumsteadville - PA
PGVP Number: A12020
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Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

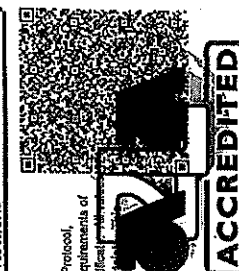
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NITRIC OXIDE	80.00 PPM	80.27 PPM	+/- 1.4% NIST Traceable	09/29/2020, 10/06/2020
SULFUR DIOXIDE	80.00 PPM	79.00 PPM	+/- 1.0% NIST Traceable	09/29/2020, 10/06/2020
NITROGEN	Balance			

CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
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PRM	12386	D85025	9.91 PPM ARGININE/NITROGEN	+/- 0.4%
NTRM	17060226	E00079109	100.3 PPM NITRIC OXIDE/NITROGEN	+/- 1.0%
GNIS	12403689	C0323707	4.028 PPM NITROGEN DIOXIDE/NITROGEN	+/- 1.0%
NTRM	07060227	E00079116	100.6 PPM NITROGEN	+/- 1.0%
NTRM	16010235	KAL004419	97.69 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%
NTRM	11010416	KAL004802	99.6 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%

ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration		
Nicolet 8700 FTIR AUP2010245 CO	FTIR	Sep 21, 2020		
Nicolet 8700 FTIR AUP2010245 NO	FTIR	Sep 14, 2020		
Nicolet 8700 FTIR AUP2010245 NO2	FTIR	Sep 22, 2020		
Nicolet 8700 FTIR AUP2010245 SO2	FTIR	Sep 16, 2020		

Triad Data Available Upon Request


NOTE: This calibration std. has been certified in accordance with the May 2012 EPA Traceability Protocol, document EPA-600/R-12/021. All testing processes and measurements conform to the requirements of ISO/IEC 17025 and to Airgas ISO 9001:2000 and relate only to items identified on this certificate. All other 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.



Approved for Release



CERTIFICATE OF ANALYSIS

Customer Detail: ALS Laboratory Group (Thailand)		Production Order Number: 90145553 Material Number: 478100-444 Certification Date: 07-Dec-2017 Expiry Date: 07-Dec-2025	
Cylinder Description: STEEL 47L		<p>The measurement of this reference material is traceable to SI through the use of a reference standard which is traceable to Swiss National Standard of Mass. The assay of this standard has been performed in accordance with the EPA Traceability Protocol EPA-600/8-12-031 for the assay and certification of Gaseous Calibration Standards using gravimetric procedures. The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k=2, providing a level of confidence of approximately 95%.</p>	
Certificate Number: 398217		Analyst: ANISSARA T. ANISSARA THONGNURL	
Cylinder Number: 14465		Approve: 	
Nominal Cylinder Content: 6.510 MPa		SUKANYA KAMUTHARAT	
Nominal Pressure: 145.0 Bar		To Re-Order Please Quote: 478100-444	
Valve Outlet: CGA 590 BRASS			
Comment:		<ul style="list-style-type: none"> It is recommended that this product be not used below 3% 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 10⁻³ of minimum minor component. Keep and use in well-ventilated and secure area. 	

Page 1 of 2

บริษัท ลินด์ (ประเทศไทย) จำกัด (มหาชน)
 บริษัท ลินด์ (ประเทศไทย) จำกัด
 15th Floor, Sanguan Tower A, 2/3 Mo 14, Sanguan Tower Bld., 6-5 Road, Bangkhruang
 Bangkok, Thailand 10150 Tel (66) 2338-4100 Fax (66) 2338-4333
 Bangkok Branch 105 Mo 5, Kungthamkarn, A Bangkok, Thailand 10180
 Wellknow Plant: 105 Mo 5, Tungsathak, A Bangkok, Thailand 21180
 Thailand, Tel (66) 34-570-479-93 Fax (66) 34-570-373

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Page 2 of 2

Linde (Thailand) Public Company Limited
P.O. Registration No. 012551100015
151st Floor, Bangsao Tower A, 7/3 Moo 14, Bangsao Trid Bldg. 6-5 Road, Bangsao New
Bangsao, Samutprakan 10540, Tel (662) 2318-6100 Fax (662) 2318-6333
Weidigwong Plant: 105 Moo 5, Bangsankom A, Bangsankong, Chachoengsao 24180
Thailand, Tel (663) 345-570-479-93 Fax (663) 345-570-323

CERTIFICATE OF ANALYSIS

Analytical Results				
Component	Request Concentration	Certified Concentration	Certified Uncertainty	Method
Oxygen	16.0 %	16.0 %	± 1% relative	(2) I-PB-354
In Nitrogen				04-Dec-2017

Reference Standard used in Assay			
Reference Standard	Cylinder No.	Concentration	Expired Date
Oxygen	I13553SG	9.9764-0.02 %	26-Mar-2018
In Nitrogen			

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

Method of Analysis

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

Cylinder Number 94892	Certification Date: 07-Dec-2017
Production Order Number 90145554	Expiration Date: 07-Dec-2025

- It is recommended that this product be not used below 3% of airtail contents or should not be used when the bag pressure is below 150psig.
- Other impurities that develop 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

Customer Details: 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 effluent standard which is traceable to Swiss National Standard of Baux. The Assay of this standard has been performed in accordance with the EPA Traceability Protocol EPA-800/1-12531 for the Assay and Certification of Gaseous Calibration Standards using procedure G1. The results are expressed on a molar basis, unless otherwise specified. The certified uncertainty is based on a standard uncertainty, not applied by coverage factor k=2, providing a level of confidence of approximately 95%.	
Certificate Number: 467615	Analyst: THIRAT LOYRAT		
Cylinder Number: S59730	Approve: SUKANYA KAMUTHARAT		
Nominal Cylinder Content: 6.520 M ³	To Re-Order Please Quote: 478100-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 2% 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 %	± 0.1% relative	(2) I-PB-354	20-Jan-2015

Reference Standard used in Assay

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

Analytical Instruments used in Assay

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

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: S59730
Production Order Number: 90132928

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

CERTIFICATE OF ANALYSIS

Customer Details: ALIS Laboratory Group (Thailand)		Production Order Number: 90137389 Material Number: 557200-J44 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 the reference standard which is traceable to Swiss National Standard of Mass. The Assay of this standard has been performed in accordance with the EPA Traceability Protocol EPA-600/R-12531 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: 2857116	Analyst: THIRAT LOYRAT		
Cylinder Number: 368075	Approve: SUKANYA KAMUTHARAT		
Nominal Cylinder Content: 6.560 M ³	To Re-Order Please Quote: 557200-J44		
Nominal Pressure: 145.0 Bar			
Valve Outlet: CCA 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	16.0 %	16.0 %	+/- 1% relative	(2) I-PB-354	24-Sep-2016
In Nitrogen					

Reference Standard used in Assay		
Reference Standard	Cylinder No.	Expiry Date
Oxygen in Nitrogen	243625SG	19-Aug-2017

Analytical Instruments used in Assay		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Servomex 4100 O2 Analyzer	Paramagnetic	24-Sep-2016

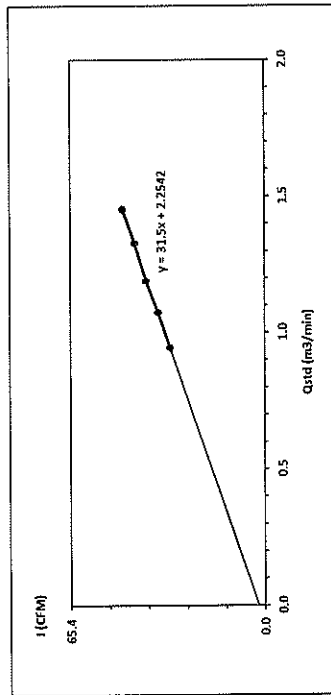
Method of Analysis	Cylinder Number: 363075 Production Order Number: 90137389
1. Gas Chromatograph 2. Paramagnetic Oxygen Analyzer 3. Electrochemical Oxygen Analyzer 4. Electrochemical Moisture Analyzer 5. Total Hydrocarbon Analyzer 6. Other specified	Certification Date: 24-Sep-2016 Expiration Date: 24-Sep-2024



High Volume Air Sampler Calibration Worksheet

Project Site: Siam Styrene Monomer Co., Ltd.
Barometric Pressure (mm Hg): 756
Calibrate Location: กรุงเทพมหานคร
Temperature (°C): 32
Calibrate Date: 25-Oct-22
High Volume ID: RYG FS0187
Calibration Sheet No.: C-251022-RYG FS0187
High Volume Model: TE-5009X
Calibrator ID: RYG FS0205
High Volume S/N: 4795
Calibrator Model: TE-5028A
Calibrator Slope: 1.50765
Calibrator S/N: 1166
Calibrator Intercept: -0.02043

Test No.	Delta H ₂ O (inch)	Q _{ad} (m ³ /min)	1: Chart (CFM)	Linear Regression
1	2.0	0.9452	32	Slope: 31.4999
2	2.6	1.0748	36	Intercept: 2.2542
3	3.2	1.1902	40	Correlation Coefficient: 0.9997
4	4.0	1.3282	44	
5	4.8	1.4530	48	



Calibrated by: Sitpawit.S
(Mr. Sitpawit Suwanmarat)
Field Scientist(1)

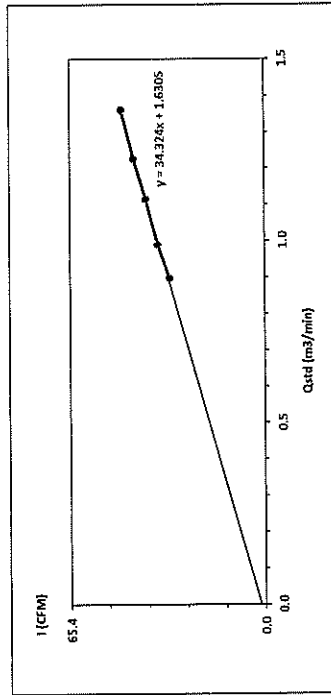
Approved by: [Signature]
(Mr. Noppong Juntarapan)
Enviro Field Coordinator Scientist (3)



High Volume Air Sampler Calibration Worksheet

Project Site: Siam Styrene Monomer Co., Ltd.
Barometric Pressure (mm Hg): 756
Calibrate Location: กรุงเทพมหานคร
Temperature (°C): 32
Calibrate Date: 25-Oct-22
High Volume ID: RYG FS0295
Calibration Sheet No.: C-251022-RYG FS0295
High Volume Model: TE-5009X
Calibrator ID: RYG FS0205
High Volume S/N: 5502
Calibrator Model: TE-5028A
Calibrator Slope: 1.50765
Calibrator S/N: 1166
Calibrator Intercept: -0.02043

Test No.	Delta H ₂ O (inch)	Q _{ad} (m ³ /min)	1: Chart (CFM)	Linear Regression
1	1.8	0.8977	32	Slope: 34.3239
2	2.2	0.9903	36	Intercept: 1.6305
3	2.8	1.1146	40	Correlation Coefficient: 0.9983
4	3.4	1.2262	44	
5	4.2	1.3605	48	



Calibrated by: Sitpawit.S
(Mr. Sitpawit Suwanmarat)
Field Scientist(1)

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



PENTA
CALIBRATION

PENTA CALIBRATION CO., LTD.
66/124 The Connect 33 Village Kanchanaphisek Road
Dokmai Prawet Bangkok 10250
Tel: +66 (0) 2069-9773
www.pentalcal.com

RYG_EN0001

Certificate of Calibration

Represent to Certificate of Calibration, PTC/07/22102

Certificate No.: PTC/07/22102
Equipment: Digital Balance
Manufacturer: Sartorius
Model: LA130S-F
Type of Balance: Single interval
Condition: Normal
Serial No: 25409664
ID No: RYG_EN0001

Customer: ALS Laboratory Group (Thailand) Co., Ltd.
616/10 Moo 5 T.Maenamkoo, A.Pluakdaeng,
Rayong 21140, Thailand

Environment Condition: Temperature 23.9 °C ± 0.3 °C
Humidity 58.1 %RH ± 4.4 %RH
Air density 1.17 kg/m³

Calibration Place: ALS Laboratory Group (Thailand) Co., Ltd.
616/10 Moo 5 T.Maenamkoo, A.Pluakdaeng,
Rayong 21140, Thailand

The Method used: In house method, PTC-WI-07, base on Euramet cg. 18
Traceability: This certificate is traceable to the SI Units through Thai Calibration Service Co., Ltd.
. NSC-ONSC Accreditation No.: Calibration 0189

Date Received: March 23, 2022
Calibration Date: March 23, 2022
Issued Date: March 25, 2022
Calibration By: Mr. Rungroje Melakui

Reviewed by:
(Mr. Kriangsak Kalasri)
Laboratory Manager

Approved By:
(Mr. Keesaisak Kerdlo)
Laboratory Manager

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 the Expression of Uncertainty in Measurement (GUM). The effect that the results relate only to the items calibrated.
This calibration certificate shall not be reproduced except in full only, without written approval from Penta Calibration Co., Ltd.

PTC/EN-01-01 2 Feb 2019



PENTA
CALIBRATION

PENTA CALIBRATION CO., LTD.
66/124 The Connect 33 Village Kanchanaphisek Road
Dokmai Prawet Bangkok 10250
Tel: +66 (0) 2069-9773
www.pentalcal.com

Represent to Certificate of Calibration, PTC/07/22102

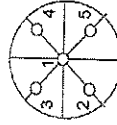
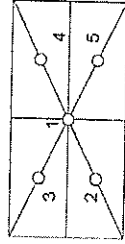
Certificate No.: PTC/07/22102

Measurement Results:

Without Adjustment:

Function Calibration: Non Adjustment

Eccentric Error: Weight to be 1/3, 1/2 or of Maximum capacity



Eccentricity test		Position (g)				
1	2	3	4	5		
0.0000	0.0000	-0.0001	0.0000	0.0001		
Maximum deviation:					0.0001	

Repeatability Test: Weight to be $1/2 \leq L_1 \leq$ Maximum capacity

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

Nominal test value (g)	Standard Deviation
100	0.00009

Error of Indication : from nominal value, Readability 0.0001 (g)

Nominal Value (g)	Conventional Mass (g)	Indication (g)	Correction of Balance (g)	Uncertainty (g)	k
0	0.00000	0.0000	0.0000	0.00026	2.87
0.01	0.01000	0.0100	0.0000	0.00026	2.65
0.05	0.05000	0.0500	0.0000	0.00026	2.65
0.1	0.10000	0.1000	0.0000	0.00026	2.65
0.5	0.50000	0.4999	0.0001	0.00026	2.65
1	1.00000	0.9999	0.0001	0.00026	2.65
2	2.00000	1.9999	0.0001	0.00026	2.65
5	5.00000	5.0000	0.0000	0.00026	2.65
10	10.00000	10.0001	-0.0001	0.00026	2.65
20	20.00003	20.0001	-0.0001	0.00026	2.52
100	100.00004	100.0001	-0.0001	0.00027	2.18

Note: Weight of adjust (g)

The End of Certificate

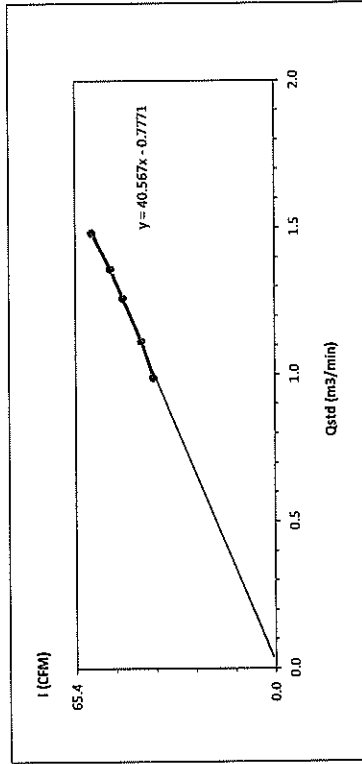
PTC/EN-01-01 2 Feb 2019



High Volume Air Sampler Calibration Worksheet

Project Site: Siam Styrene Monomer Co., Ltd. Barometric Pressure (mm Hg): 756
Calibrate Location: กรุงเทพมหานคร High Volume ID: 32
Calibrate Date: 25-Oct-22 RYG_FS0173
Calibration Sheet No.: C-251022-RYG_FS0173 High Volume Model: TE-5170D
Calibrator ID: RYG_FS0205 High Volume S/N: 4799
Calibrator Model: TE-5028A High Volume S/N: 150765
Calibrator S/N: 1166 Calibrator Intercept: -0.02043

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.2	0.9903	40	Slope: 40.5669 Intercept: -0.7771 Correlation Coefficient: 0.9975
2	2.8	1.1146	44	
3	3.6	1.2611	50	
4	4.2	1.3605	54	
5	5.0	1.4826	60	



Calibrated by: Sitpawit.S

(Mr. Sitpawit Suwannarat)
Field Scientist(1)

Approved by: [Signature]

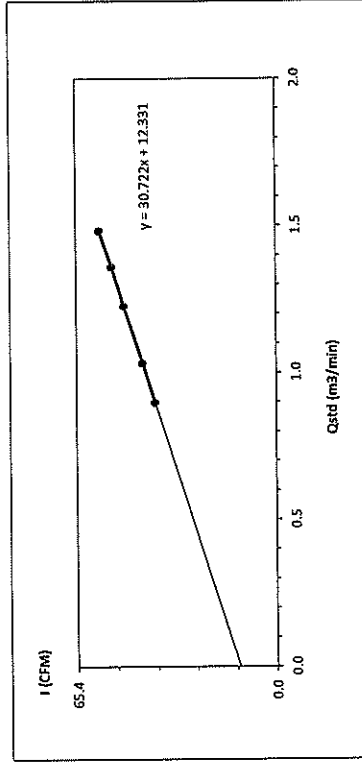
(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)



High Volume Air Sampler Calibration Worksheet

Project Site: Siam Styrene Monomer Co., Ltd. Barometric Pressure (mm Hg): 756
Calibrate Location: กรุงเทพมหานคร High Volume ID: 32
Calibrate Date: 25-Oct-22 RYG_FS0396
Calibration Sheet No.: C-251022-RYG_FS0396 High Volume Model: TE-5170D
Calibrator ID: RYG_FS0205 High Volume S/N: 5688
Calibrator Model: TE-5028A High Volume S/N: 150765
Calibrator S/N: 1166 Calibrator Intercept: -0.02043

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	1.8	0.8977	40	Slope: 30.7217 Intercept: 12.3314 Correlation Coefficient: 0.9999
2	2.4	1.0334	44	
3	3.4	1.2262	50	
4	4.2	1.3605	54	
5	5.0	1.4826	58	



Calibrated by: Sitpawit.S

(Mr. Sitpawit Suwannarat)
Field Scientist(1)

Approved by: [Signature]

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



MULTIPOINT CALIBRATION REPORT

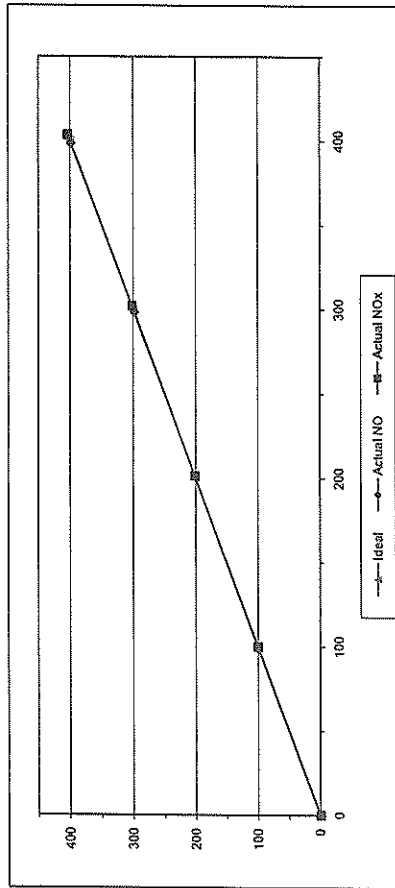
Calibration Date 1-Jul-22
Manufacturer HORIBA
Serial No. T95HWM41
Calibrator Manufacturer Telebyte API
Serial No. 947
Std. Gas Concentration (PPM) 55.88
Cylinder Pressure (psi) 1800
Certified Date 9-Feb-22

NOx Analyzer
APNA-370
RYG_FS0461
700

Equipment Name
Model
Equipment ID
Model

Cylinder No. GN0027222
Certified By Airgas Inc.
Expired Date 9-Feb-30

Point	CALIBRATION RESULTS					
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10
1	100.00	98.70	-1.30	-1.30	100.10	0.10
2	200.00	201.00	1.00	0.50	201.40	1.40
3	300.00	298.30	-1.70	-0.57	302.10	2.10
4	400.00	398.40	-1.60	-0.40	403.50	3.50
AVERAGE (%)						0.50



Calibrated By

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

Approved By

(Mr. Sarayuth Jitranont)
Assistant General Manager



MULTIPOINT CALIBRATION REPORT

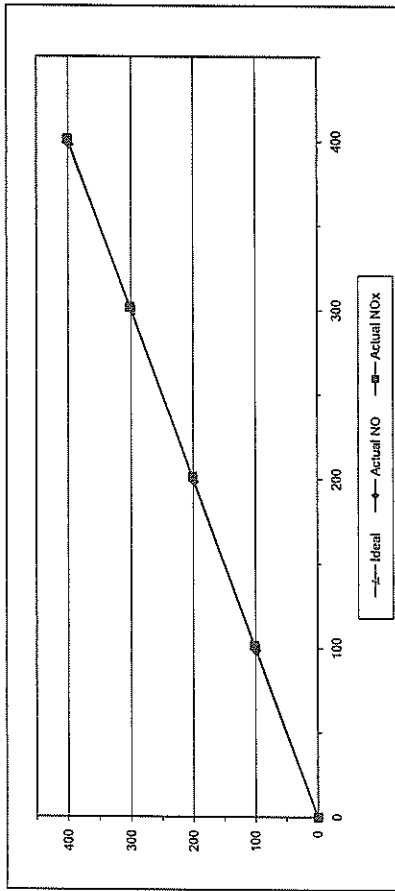
Calibration Date 1-Jul-22
Manufacturer HORIBA
Serial No. ALPOV0WY
Calibrator Manufacturer Telebyte API
Serial No. 947
Std. Gas Concentration (PPM) 55.88
Cylinder Pressure (psi) 1800
Certified Date 9-Feb-22

NOx Analyzer
APNA-370
RYG_FS0455
700

Equipment Name
Model
Equipment ID
Model

Cylinder No. GN0027222
Certified By Airgas Inc.
Expired Date 9-Feb-30

Point	CALIBRATION RESULTS					
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10
1	100.00	98.60	-1.40	-1.40	101.60	1.60
2	200.00	198.70	-1.30	-0.65	201.40	1.40
3	300.00	301.00	1.00	0.33	301.80	1.80
4	400.00	398.20	-1.80	-0.45	401.20	1.20
AVERAGE (%)						0.66



Calibrated By

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

Approved By

(Mr. Sarayuth Jitranont)
Assistant General Manager

CERTIFICATE OF CALIBRATION

Certificate No: WS-01062021

Page 1 of 2 pages

Measurement Item : Cup anemometer with data logger

Manufacturer : Data logger: Novatek

Model/Type : Cup anemometer: Novatek

Serial Number : Data logger: WS-250L

ID No : Cup anemometer: WS-02P

Customer : Data logger: A4481

Test Conditions : Cup anemometer :

Test Results : Data logger: BMS FS0141

Calibration Procedure : Cup anemometer :

Traceability : ALS Laboratory group (Thailand) co., Ltd.

Measurement Date : 104 Phatthanaban 40, Phatthanaban Rd, Khwaeng Sun Luang, Khet Sun Luang, Bangkok 10260 Thailand

Measurement Date

Issued Date

Calibrated by

Mr. Soravit Thachalad

Mr. Orathai Wathakulay

Calibration Procedure

Calibration was carried out base on:
IEC 61400-12-1 Ed.1: 2005-Power Performance Measurements of Electricity Producing Wind Turbines
ISO/IEC 17025:2005 Calibration Procedure - Version 2: 2009

Traceability : This calibration documents the traceable to national standard, which realize the unit of measurements according to the international system of units (SI) through National Institute of Metrology Thailand (NIMT).

Measurement Date

Issued Date

Calibrated by

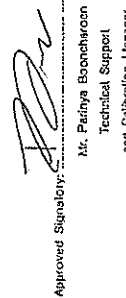
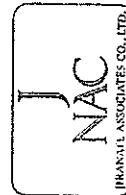
Mr. Soravit Thachalad

Mr. Orathai Wathakulay

Approved Signatory

Mr. Panyia Booncharoon

Technical Support and Calibration Manager



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

Continuation of Certificate of Calibration Number

Certificate No: WS-01062021

Page 2 of 2 Pages

Result of calibration: ☒ Without adjustment ☐ With adjustment

Calibration in the range of 1 - 10 m/s at a calibration interval of 1 m/s

The results of calibration and associated measurement uncertainties are reported in the table below.

Van Reading m/s	Van Reading m/s	Error (m/s)	Uncertainty (%)
2.055	2.0	-0.1	2.6
4.124	4.0	-0.1	1.2
5.99	6.0	0.0	1.01
8.00	8.0	0.0	0.74
9.99	10.1	0.1	0.60
11.96	12.2	0.2	0.67
14.02	14.4	0.4	0.45
16.03	16.6	0.6	0.36
18.01	18.3	0.3	2.8
12.99	13.3	0.3	0.41
10.99	11.2	0.2	0.53
9.01	9.3	0.3	1.2
7.05	7.0	0.0	0.77
5.121	5.0	-0.1	0.88
3.046	3.0	0.0	1.8
1.088	1.0	-0.1	5.3

UNIT: Unit Under Calibration

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

Appendix 1: Instrumentations

NO	Sensor	Manufacturer	Model/Type	Calibration Date	Certificate Report Number	Range
1	Pict saltic	TESTO INC	063521748	July 16, 2020	MY-0035-20	5 - 30 m/s
2	Precision Differential Pressure Meter	Zojlab	DPN3500	July 16, 2020	MY-0035-20	5 - 30 m/s
3	At velocity transducer (pict wire)	TBI INC	8455-12	July 20, 2020	MY-0035-20	0 - 5 m/s
4	Temperature	Zojlab	DSR-THP	March 30, 2021	Q-0927-64	-30 - 70°C
5	Relative humidity	Zojlab	DSR-THP	March 30, 2021	PH-03032021	0 - 100 %RH
6	Atmospheric pressure	Zojlab	DSR-THP	March 30, 2021	BP-01032021	500 - 1100 hPa
7	Wind tunnel	CS50M	MP330D	-	-	0 - 50 Hz

End of certificate of calibration



CERTIFICATE OF CALIBRATION

Certificate No: WD-01062021
Page 1 of 2 pages

Measurement Item : Wind direction sensor with data logger.

Manufacturer : Data logger: Novallynx.

: Wind direction sensor: Novallynx.

Model/Type : Data logger: WS-26DL.

: Wind direction sensor: WS-02P.

Serial Number : Data logger: A4481.

: Wind direction sensor: -

ID No : Data logger: BKK_FSO141.

: Cup anemometer: -

Customer : ALS laboratory group (Thailand) Co.Ltd.
104 Phatthanakan 40, Phatthanakan Rd,Khwaeng Suan Luang, Khut Suan Luang,Bangkok 10260
Thailand.

Environmental Condition:

The measurement was carried out in an ambient temperature of (23±3)°C, and relative humidity of (40±10)%.

Measurement Method:

The wind direction sensor calibration according to comparison method with reference angle measurement electronic theodolite and the laser is used for axis control. The measurement were taken at 45° intervals in clockwise and counterclockwise directions.

Note: The UUC was warmed up for 1 hour prior to the calibration being performed

Traceability:

The measurement results are traceable to the international system of units (SI) through Certificate No: QC563-07-0045, Certificate No: WWSA3/0044.

Measurement Date : Jun 07, 2021.
Issued Date : Jun 07, 2021.

Performed by

☒ Mr. Soravit Thachwaid
☐ Miss Orathai Wivattavanya

Approved Signatory:

Mr. Peinya Booncharoen.
Technical Support
and Calibration Manager

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Continuation of Certificate of Calibration Number

Certificate No: WD-01062021
Pages 2 of 2 pages

Result of calibration: ☐ Without adjustment ☒ With adjustment.

Calibration in the range of 0 - 360 ° at a calibration interval of 45°.

The results of calibration and associated measurement uncertainties are reported in table below.

NO	Turning Direction	Nominal Angle (°)	Standard Reading (°)	UUC* Reading (°)	Error (°)	Uncertainty ±(°)
1	Clockwise	0/360	0	0	0	3.0
2		45	45	42	-3	3.0
3		90	90	90	0	3.0
4		135	135	136	1	3.0
5		180	180	182	2	3.0
6		225	225	227	2	3.0
7		270	270	273	3	3.0
8		315	315	314	-1	3.0
9	Counter Clockwise	0/360	0	0	0	3.0
10		45	45	42	-3	3.0
11		90	90	90	0	3.0
12		135	135	136	1	3.0
13		180	180	182	2	3.0
14		225	225	227	2	3.0
15		270	270	273	3	3.0
16		315	315	314	-1	3.0

UUC*: Unit Under Calibration The reported expanded uncertainty is based on standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95%

End of Certificate of Calibration



CERTIFICATE OF CALIBRATION

Certificate No: WS-01102021

Page 1 of 2 pages

Measurement Item

: Cup anemometer with data logger.

Manufacturer

: Data logger: Novatek.

: Cup anemometer: Novatek.

Model/Type

: Data logger: 200-WS-25DL

: Cup anemometer: WS-02F

Serial Number

: Data logger: A4985

: Cup anemometer: -

ID No

: Data logger: RYG_FSC0095

: Cup anemometer: -

Customer

: ALS laboratory group (Thailand) co., Ltd.

: 104 Phatthanakan 4D, Phatthanakan Rd, Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250 Thailand.

Test Conditions

: Wind tunnel cross test section area

: Anemometer frontal area

: Diameter of mounting pipe

: Blockage ratio of test object

Test Conditions

: Air temperature

: Air pressure

: Relative air humidity

Calibration Procedure

: Calibration was carried out base on:

IEC 61400-12-1 6D.1: 2005 Power Performance Measurements of Electricity Producing Wind Turbines.

MEASNET Anemometer Calibration Procedure - Version 2: 2009.

Traceability

This calibration documents the traceable to national standards, which realize the unit of measurements according to the international system of units (SI) through National Institute of Metrology Thailand (NIMT).

Measurement Date

: Oct 08, 2021.

: Oct 11, 2021.

Calibrated by

☒ Mr. Satek Thachalad

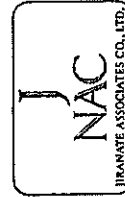
☐ Mr. Orabhai Watanakulaya

Approved Signatory:

Mr. Pichya Booncharoen

Technical Support

and Calibration Manager



Continuation of Certificate of Calibration Number

Certificate No: WS-01102021

Page 2 of 2 Pages

Result of calibration: ☒ Without adjustment ☐ With adjustment

Calibration in the range of 1 - 10 m/s at a calibration interval of 1 m/s.

The results of calibration and associated measurement uncertainties are reported in the table below.

V _{ref} Reading m/s	V _{ref} Reading m/s	Error (m/s)	Uncertainty (%)
2.049	1.9	-0.1	2.7
4.103	4.0	-0.1	1.3
6.01	6.0	0.0	1.1
8.01	8.0	0.0	0.99
9.99	10.0	0.0	1.0
11.99	12.1	0.1	0.64
13.98	14.1	0.1	0.66
16.02	16.2	0.2	0.40
18.03	18.2	0.2	0.78
12.99	13.1	0.1	0.61
11.03	11.0	0.0	1.1
9.00	9.0	0.0	0.75
7.02	7.0	0.0	0.84
5.147	5.0	-0.1	0.98
2.974	2.9	-0.1	1.7
1.013	0.9	-0.1	4.6

UUC: Unit Under Calibration

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

Appendix 1: Instrumentations

NO	Sensor	Manufacturer	Model/Type	Calibration Date	Certificate Report Number	Range
1	Flot 842C	TESTO INC.	03302145	Aug 07, 2021	MY-0034-21	5 - 30 m/s
2	Precision Differential Pressure Meter	Zepha	DPA2500	Aug 07, 2021	MY-0034-21	5 - 30 m/s
3	Air velocity transducer (hot wire)	TSI INC.	8456-12	Aug 06, 2021	MY-0035-21	0 - 6 m/s
4	Temperature	Zepha	DSP-11P	March 30, 2021	CL-027-24	-30 - 70°C
5	Relative humidity	Zepha	DSP-11P	March 30, 2021	PH-03032021	0 - 100 %RH
6	Atmospheric pressure	Zepha	DSP-11P	March 30, 2021	GP-01032021	500 - 1100 hPa
7	Wind tunnel	CSSQU	MP3300	.	.	0 - 50 Hz

End of certificate of calibration





63/14-15,67/35-36, Soi Petchkasem 7,7/1, Petchkasem Rd,
Wathapra, Bangkokyai,Bangkok 10600 Thailand.
Tel: (66) 02-8680812#13 Fax: (66) 02-8680860 www.jiranatee.com

CERTIFICATE OF CALIBRATION

Certificate No: WD-01102021
Page 1 of 2 pages

Measurement item : Wind direction sensor with data logger
Manufacturer : Data logger: Novalynx.
Wind direction sensor: Novalynx.
Model/Type : Data logger: 200-WS-25DL
Wind direction sensor: WS-02P
Serial Number : Data logger: A4985
Wind direction sensor: -
ID No : Data logger: RYG F50085
Wind direction sensor: -

Customer : ALS laboratory group (Thailand) Co.Ltd
104 Phatthanakan 40, Phatthanakan Rd,Kruang Suan Luang, Kruat Suan Luang, Bangkok 10260
Thailand.

Environmental Condition:

The measurement was carried out in an ambient temperature of (23±3) °C, and relative humidity of 40±10 %.

Measurement Method:

The wind direction sensor calibration according to comparison method with reference angle measurement electronic theodolite and line laser is used for axis control. The measurement were taken at 45° intervals in clockwise and counterclockwise directions.

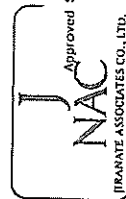
Note: The UUC was warned up for 1 hour prior to the calibration being performed

Traceability:

The measurement results are traceable to the international system of units (SI) through Certificate No: CG563-07-0045.
Certificate No: KWS64/0025.

Measurement Date : Oct 08, 2021.
Issued Date : Oct 11, 2021

Performed by
☒ Mr. Sorek Thachad
☐ Miss Orathai Wirovitwitya



Approved Signatory:
Mr. Parinya Boonchuroen,
Technical Support
and Calibration Manager

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



63/14-15,67/35-36, Soi Petchkasem 7,7/1, Petchkasem Rd,
Wathapra, Bangkokyai,Bangkok 10600 Thailand.
Tel: (66) 02-8680812#13 Fax: (66) 02-8680860 www.jiranatee.com

Continuation of Certificate of Calibration Number

Certificate No: WD-01102021
Pages 2 of 2 pages

Result of calibration: ☐ Without adjustment ☒ With adjustment.
Calibration in the range of 0 - 360 ° at a calibration interval of 45°.
The results of calibration and associated measurement uncertainties are reported in table below.

NO	Turning Direction	Nominal Angle (°)	Standard Reading (°)	UUC* Reading (°)	Error (°)	Uncertainty ±(°)
1		0/360	360	359	-1	3.0
2		45	45	42	-3	3.0
3		90	90	88	-2	3.0
4	Clockwise	135	135	135	0	3.0
5		180	180	182	2	3.0
6		225	225	228	3	3.0
7		270	270	273	3	3.0
8		315	315	318	3	3.0
9		0/360	360	359	-1	3.0
10		45	45	42	-3	3.0
11		90	90	88	-2	3.0
12	Counter Clockwise	135	135	136	0	3.0
13		180	180	182	2	3.0
14		225	225	228	3	3.0
15		270	270	273	3	3.0
16		315	315	318	3	3.0

UUC*: Unit Under Calibration. The reported expanded uncertainty is based on standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95%.

End of Certificate of Calibration





ROTA METER CALIBRATION RESULT JULY 2022

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
BKK_FS0577	01 Jul 22	$Y = 1.0202x + 0.1976$	1.0000
BKK_FS0579	01 Jul 22	$Y = 1.0078x + 0.4789$	0.9998
BKK_FS0583	01 Jul 22	$Y = 1.016x + 0.3922$	1.0000
BKK_FS0584	01 Jul 22	$Y = 1.0036x + 2.2262$	0.9997
BKK_FS0585	01 Jul 22	$Y = 1.0189x - 5.6476$	0.9997
BKK_FS0586	01 Jul 22	$Y = 1.0095x - 1.1524$	0.9995
BKK_FS0587	01 Jul 22	$Y = 1.013x - 3.6619$	0.9996
BKK_FS0588	01 Jul 22	$Y = 1.0154x + 4.8357$	0.9999
BKK_FS0589	01 Jul 22	$Y = 0.9918x + 4.8069$	0.9999
BKK_FS0590	01 Jul 22	$Y = 1.0038x - 0.4857$	0.9996
BKK_FS0591	01 Jul 22	$Y = 0.9705x - 52.174$	0.9986
BKK_FS0592	01 Jul 22	$Y = 0.9646x - 37.642$	0.9985
BKK_FS0593	01 Jul 22	$Y = 0.9767x - 58.445$	0.9988
BKK_FS0594	01 Jul 22	$Y = 0.9902x - 62.87$	0.9999
BKK_FS0595	01 Jul 22	$Y = 1.0249x - 98.162$	0.9999
BKK_FS0596	01 Jul 22	$Y = 0.9843x - 26.806$	0.9991
BKK_FS0597	01 Jul 22	$Y = 0.9802x - 61.653$	0.9978
BKK_FS1004	01 Jul 22	$Y = 0.9696x + 17.69$	0.9990
BKK_FS1005	01 Jul 22	$Y = 1.0092x + 2.4571$	0.9999
BKK_FS1006	01 Jul 22	$Y = 1.168x - 5.566$	0.9997
BKK_FS1007	01 Jul 22	$Y = 0.9917x + 1.6592$	1.0000
BKK_FS1008	01 Jul 22	$Y = 1.0132x + 0.7207$	1.0000
BKK_FS1009	01 Jul 22	$Y = 1.0132x + 1.1633$	0.9960
BKK_FS1010	01 Jul 22	$Y = 1.0033x + 0.5758$	0.9999
BKK_FS1011	01 Jul 22	$Y = 1.0234x + 0.1759$	0.9996
BKK_FS1012	01 Jul 22	$Y = 1.0106x - 2.0048$	0.9997
BKK_FS1013	01 Jul 22	$Y = 0.9677x - 35.851$	0.9997
BKK_FS1014	01 Jul 22	$Y = 1.0021x + 0.3148$	0.9998
BKK_FS1015	01 Jul 22	$Y = 0.9994x + 1.786$	1.0000
BKK_FS1016	01 Jul 22	$Y = 1.0105x - 80.256$	0.9998
BKK_FS1017	01 Jul 22	$Y = 0.9995x + 0.649$	1.0000
BKK_FS1018	01 Jul 22	$Y = 1.0011x + 1.1786$	1.0000
BKK_FS1019	01 Jul 22	$Y = 1.0023x - 68.424$	0.9996
BKK_FS1020	01 Jul 22	$Y = 1.0547x - 0.666$	0.9998
BKK_FS1021	01 Jul 22	$Y = 1.018x - 3.3286$	0.9998
BKK_FS1022	01 Jul 22	$Y = 0.9932x - 57.035$	0.9986
BKK_FS1023	01 Jul 22	$Y = 1.0094x + 0.0717$	0.9999
BKK_FS1024	01 Jul 22	$Y = 1.0042x + 0.4086$	0.9997
BKK_FS1025	01 Jul 22	$Y = 1.0132x - 88.507$	0.9996



ROTA METER CALIBRATION RESULT JULY 2022

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
BKK_FS1026	01 Jul 22	$Y = 1.0018x + 1.0776$	0.9997
BKK_FS1027	01 Jul 22	$Y = 1.0053x + 0.231$	0.9995
BKK_FS1028	01 Jul 22	$Y = 0.9792x - 60.312$	0.9982
BKK_FS1029	01 Jul 22	$Y = 0.9935x + 0.8234$	1.0000
BKK_FS1030	01 Jul 22	$Y = 1.0039x + 0.515$	0.9999
BKK_FS1031	01 Jul 22	$Y = 1.009x - 79.295$	0.9998
BKK_FS1039	01 Jul 22	$Y = 0.9879x + 7.3524$	0.9996
BKK_FS1040	01 Jul 22	$Y = 0.9704x + 88.336$	0.9987
BKK_FS1041	01 Jul 22	$Y = 1.0645x - 1.7878$	0.9999
BKK_FS1042	01 Jul 22	$Y = 0.9983x + 3.6262$	0.9998
BKK_FS1043	01 Jul 22	$Y = 1.0069x - 6.9619$	1.0000
BKK_FS1044	01 Jul 22	$Y = 1.0355x - 0.6214$	0.9997
BKK_FS1161	01 Jul 22	$Y = 1.0126x + 0.7738$	0.9999
BKK_FS1162	01 Jul 22	$Y = 0.9994x + 2.8357$	0.9995
BKK_FS1163	01 Jul 22	$Y = 0.977x - 55.03$	0.9987
BKK_FS1164	01 Jul 22	$Y = 0.9914x + 0.8427$	0.9997
BKK_FS1165	01 Jul 22	$Y = 0.9893x + 6.5919$	0.9998
BKK_FS1166	01 Jul 22	$Y = 1.0031x - 77.861$	0.9996
BKK_FS1200	01 Jul 22	$Y = 1.0313x - 0.4602$	0.9995
BKK_FS1201	01 Jul 22	$Y = 1.0045x + 0.15$	0.9996
BKK_FS1202	01 Jul 22	$Y = 0.9702x - 44.156$	0.9994
RYG_FS0197	01 Jul 22	$Y = 1.0039x - 0.179$	0.9999
RYG_FS0198	01 Jul 22	$Y = 0.9971x + 16.648$	0.9999
RYG_FS0199	01 Jul 22	$Y = 1.0832x - 2.6367$	1.0000

Review By :

Wichan Choonharat

(Mr. Wichan Choonharat)

Enviro Field Services Manager

Approved By :

Sarayu Jitranont

(Mr. Sarayu Jitranont)

Assistant General Manager



ROTA METER CALIBRATION RESULT OCTOBER 2022

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
BKK_FS0577	01 Oct 22	$Y = 1.0202x + 0.1976$	1.0000
BKK_FS0579	01 Oct 22	$Y = 1.0078x + 0.4789$	0.9998
BKK_FS0583	01 Oct 22	$Y = 1.016x + 0.3922$	1.0000
BKK_FS0584	01 Oct 22	$Y = 1.0036x + 2.2262$	0.9997
BKK_FS0585	01 Oct 22	$Y = 1.0189x - 5.6476$	0.9997
BKK_FS0586	01 Oct 22	$Y = 1.0095x - 1.1524$	0.9995
BKK_FS0587	01 Oct 22	$Y = 1.013x - 3.6619$	0.9996
BKK_FS0588	01 Oct 22	$Y = 1.0154x + 4.8357$	0.9999
BKK_FS0589	01 Oct 22	$Y = 0.9918x + 4.8069$	0.9999
BKK_FS0590	01 Oct 22	$Y = 1.0038x - 0.4857$	0.9996
BKK_FS0591	01 Oct 22	$Y = 0.9705x - 52.174$	0.9986
BKK_FS0592	01 Oct 22	$Y = 0.9646x - 37.642$	0.9985
BKK_FS0593	01 Oct 22	$Y = 0.9767x - 58.445$	0.9988
BKK_FS0594	01 Oct 22	$Y = 0.9902x - 62.87$	0.9999
BKK_FS0595	01 Oct 22	$Y = 1.0249x - 98.162$	0.9999
BKK_FS0596	01 Oct 22	$Y = 0.9843x - 28.806$	0.9991
BKK_FS0597	01 Oct 22	$Y = 0.9802x - 61.653$	0.9978
BKK_FS1004	01 Oct 22	$Y = 0.9762x + 11.724$	0.9998
BKK_FS1005	01 Oct 22	$Y = 1.0081x + 1.5143$	1.0000
BKK_FS1006	01 Oct 22	$Y = 1.098x - 2.9327$	0.9999
BKK_FS1007	01 Oct 22	$Y = 0.9917x + 1.6592$	1.0000
BKK_FS1008	01 Oct 22	$Y = 1.0132x + 0.7207$	1.0000
BKK_FS1009	01 Oct 22	$Y = 1.0132x + 1.1633$	0.9960
BKK_FS1010	01 Oct 22	$Y = 1.0033x + 0.5758$	0.9999
BKK_FS1011	01 Oct 22	$Y = 1.0234x + 0.1759$	0.9996
BKK_FS1012	01 Oct 22	$Y = 1.0106x - 2.0048$	0.9997
BKK_FS1013	01 Oct 22	$Y = 0.9677x - 35.851$	0.9997
BKK_FS1014	01 Oct 22	$Y = 1.0021x + 0.3148$	0.9998
BKK_FS1015	01 Oct 22	$Y = 0.9994x + 1.786$	1.0000
BKK_FS1016	01 Oct 22	$Y = 1.0105x - 80.256$	0.9998
BKK_FS1017	01 Oct 22	$Y = 0.9995x + 0.649$	1.0000
BKK_FS1018	01 Oct 22	$Y = 1.0011x + 1.1786$	1.0000
BKK_FS1019	01 Oct 22	$Y = 1.0023x - 68.424$	0.9996
BKK_FS1020	01 Oct 22	$Y = 1.0547x - 0.666$	0.9998
BKK_FS1021	01 Oct 22	$Y = 1.018x - 3.3286$	0.9998
BKK_FS1022	01 Oct 22	$Y = 0.9932x - 57.035$	0.9986
BKK_FS1023	01 Oct 22	$Y = 1.0094x + 0.0717$	0.9999
BKK_FS1024	01 Oct 22	$Y = 1.0042x + 0.4086$	0.9997
BKK_FS1025	01 Oct 22	$Y = 1.0132x - 88.507$	0.9996



ROTA METER CALIBRATION RESULT OCTOBER 2022

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
BKK_FS1026	01 Oct 22	$Y = 1.0018x + 1.0776$	0.9997
BKK_FS1027	01 Oct 22	$Y = 1.0053x + 0.231$	0.9995
BKK_FS1028	01 Oct 22	$Y = 0.9792x - 60.312$	0.9982
BKK_FS1029	01 Oct 22	$Y = 0.9935x + 0.8234$	1.0000
BKK_FS1030	01 Oct 22	$Y = 1.0039x + 0.515$	0.9999
BKK_FS1031	01 Oct 22	$Y = 1.008x - 79.295$	0.9998
BKK_FS1039	01 Oct 22	$Y = 0.9967x + 4.5048$	0.9999
BKK_FS1040	01 Oct 22	$Y = 0.9936x + 32.694$	0.9998
BKK_FS1041	01 Oct 22	$Y = 1.067x - 1.999$	1.0000
BKK_FS1042	01 Oct 22	$Y = 1.0019x + 2.1571$	1.0000
BKK_FS1043	01 Oct 22	$Y = 1.1569x - 96.479$	0.8412
BKK_FS1044	01 Oct 22	$Y = 1.0318x - 0.9374$	0.9999
BKK_FS1161	01 Oct 22	$Y = 1.0126x + 0.7738$	0.9999
BKK_FS1162	01 Oct 22	$Y = 0.9994x + 2.6357$	0.9995
BKK_FS1163	01 Oct 22	$Y = 0.977x - 55.03$	0.9987
BKK_FS1164	01 Oct 22	$Y = 0.9914x + 0.8427$	0.9997
BKK_FS1165	01 Oct 22	$Y = 0.9893x + 6.5919$	0.9998
BKK_FS1166	01 Oct 22	$Y = 1.0031x - 77.881$	0.9996
BKK_FS1200	01 Oct 22	$Y = 1.0313x - 0.4602$	0.9995
BKK_FS1201	01 Oct 22	$Y = 1.0045x + 0.15$	0.9996
BKK_FS1202	01 Oct 22	$Y = 0.9702x - 44.156$	0.9994
RYG_FS0197	01 Oct 22	$Y = 1.0039x - 0.179$	0.9999
RYG_FS0198	01 Oct 22	$Y = 0.9964x + 21.757$	1.0000
RYG_FS0199	01 Oct 22	$Y = 1.0577x - 1.7486$	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 Phatthanasak 40, Phatthanasak Rd., Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250

Date: October 1, 2021 1:10:17 PM
EQP Name: AgilentRecommended, AgilentRecommended
EQP Revision: GC.02.51, GCMS.02.51
Overall Qualification Status: Pass

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 24.9 psi
Accuracy: 0.1 psi 1.2 psi
Agilent Recommended: ≤ 1.2

Overall Inlet Pressure Accuracy Test Status

Pass

GC Oven Temperature Accuracy

Name: 7890

Date: October 1, 2021 1:10:17 PM
System ID: GM-2

Setpoint Status: Pass
Zone: Oven

Temperature: 230.0 °C
Setpoint/Actual: 230.5 °C

Accuracy: 0.5 °C
Agilent Recommended: ≥ -1.0 °C ≤ 1.0 °C
% setpoint in K (-5.0) °C
% setpoint in K (5.0) °C

Setpoint Status: Pass
Zone: Oven

Temperature: 100.0 °C
Setpoint/Actual: 101.5 °C

Accuracy: 1.5 °C
Agilent Recommended: ≥ -1.0 °C ≤ 1.0 °C
% setpoint in K (-3.7) °C
% setpoint in K (3.7) °C

Overall GC Oven Temperature Accuracy Test Status

Pass

GC Oven Temperature Stability

Name: 7890

Setpoint Status: Pass

Temperature: 100.0 °C
Setpoint/Average: 101.5 °C

Stability: 0.0 °C
Agilent Recommended: ≤ 0.5 °C

Overall GC Oven Temperature Stability Test Status

Pass

Log Amp

Tested Combination: Front MMI / External SQ
Name: 5975C Inert XL with TAD

Setpoint Status: Pass

Date: October 1, 2021 1:10:17 PM
System ID: GM-2

Overall Log Amp Test Status

Pass

RFA

Tested Combination1

Front

MMI

/ External

SQ

Name:

5975C Inert XL with TAD

Pass

Setpoint Status:

Amur: 1050 m/z

Drift After Five Minutes:

6 mV

and

-100

≤

100

RFA Voltage:

461 mV

≤

1100

Agilent Recommended:

Overall RFA Test Status

Pass

Tune EI

Tested Combination1

Front

MMI

/ External

SQ

Name:

5975C Inert XL with TAD

Pass

Setpoint Status:

Filament:

1

Setpoint Status:

Filament:

2

Overall Tune EI Test Status

Pass

Scouting Run

Tested Combination1

Front

MMI

/ External

SQ

Injection Tower

7693A

EI - Inert

Name:

Source:

Setpoint Status:

Completed

Injection Volume on Column:

1.0

μL

Overall Scouting Run Status

Completed

Signal to Noise EI

Tested Combination1

Front

MMI

/ External

SQ

Name:

5975C Inert XL with TAD

Pass

Source:

EI - Inert

Filament:

1

Setpoint Status:

Pass

Signal to Noise:

Agilent Recommended:

619

≥

320

Source:

EI - Inert

Filament:

2

Setpoint Status:

Pass

Signal to Noise:

Agilent Recommended:

647

≥

320

Overall Signal to Noise EI Test Status

Pass

Injection Precision

Tested Combination1

Front

MMI

/ External

SQ

Name:

7693A

EI - Inert

Setpoint Status:

Pass

Injection Volume on Column:

1.0

μL

Area RSD:

Agilent Recommended:

4.75

≤

5.00

Retention Time RSD:

0.02

≤

1.00

Overall Injection Precision Test Status

Pass

Mass Ratio Precision

Tested Combination1 Front MM1 / External SQ

Injection Tower

Name: 7693A

Source: EI - Inert

Setup Status: Pass

Injection Volume on Column:

1.0 µL

Area Mass 1

Abundance's

4.75	%
<= 5.00	Pass

Mass Ratio

0.81	%
<= 5.00	Pass

RSD:

Agilent Recommended:

Overall Mass Ratio Precision Test Status

Pass

Instrument Details

Purpose

This section describes the as found system configuration.

Details

System	GM-2
System ID	Agilent Technologies
Manufacturer	7690
Name	Manual Data
Flow Data Input	Manual Data or Other Data Logging
Temperature Data Input	
Tested Combination1	Injection Tower
Injection Technique	Front
Inlet	External
Detector	No
LTM Included?	
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 (µL)	10

Mass Ratio Precision

Tested Combination1 Front MM1 / External SQ

Injection Tower

Name: 7693A

Source: EI - Inert

Setup Status: Pass

Injection Volume on Column:

1.0 µL

Area Mass 1

Abundance's

4.75	%
<= 5.00	Pass

Mass Ratio

0.81	%
<= 5.00	Pass

RSD:

Agilent Recommended:

Overall Mass Ratio Precision Test Status

Pass

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Sampler 2

Manufacturer Agilent Technologies
Type Tray
Name 7893A
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 MMT
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

Agilent CrossLab Compliance Services

Date: October 1, 2021 1:10:17 PM
System ID: GM-2

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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

Date: October 1, 2021 1:10:17 PM
System ID: GM-2

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Electronic Signature

Purpose

This signature page was created and published because the ACE sign-off action was executed, which is valid for the entire document, including attachments. The ACE sign-off is an electronic signature that requires two distinct identification components: unique username and personal password. The Agilent representative who has delivered this service understands the meaning and legal status of an electronic signature. As a trained official operator, the Agilent representative has a unique password and login to access ACE and electronically sign this document. (Other e-signatures can be applied to this document using a Document Content Management or other suitable method defined in your data access and control procedures.)

Details

Full Name of Signer: Supasak Nimsongtham
Logged On User Name: supasak.nimsongtham@agilent.com
Signature Creation Date: October 1, 2021
Reason for Signature: Executed protocol and published this original version of document

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User Name: supasak.nimsongtham
Hostname: SCG1115HMC
Print Date: October 1, 2021 1:10:19 PM
System Id: GM-2

ALS_GM2 Transaction Log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 1, 2021 12:42:37 PM	Audit	Session Created	Session	None
October 1, 2021 12:42:37 PM	Start	Configuration	Session	None
October 1, 2021 12:42:37 PM	Audit	Enrollment	Licensing	User is FindEngineer and does not require an unlock code
October 1, 2021 12:44:21 PM	Audit	Eqp Loaded	Session	EOP details for primary technique (GC) - File path: [ProtocolPath\GCs\GC02.02.51.mop] EOP File Name: [GC02.02.51.mop] EOP Name: [AgilentRecommended] EOP details for hyphenated technique (GCMS) - File path: [ProtocolPath\GCs\GC02.02.51.mop] EOP File Name: [GC02.02.51.mop] EOP Name: [AgilentRecommended]
October 1, 2021 12:44:24 PM	End	Configuration	Session	None
October 1, 2021 12:44:28 PM	Start	Qualification	Session	OQ
October 1, 2021 12:44:28 PM	Start	Execution	System Inspection and Basic Safety and Operation - 7800 - Qualitative Test - No samples associated	None

User Name: supasak.nimsongtham
Host Name: SCG115HHC
ALS_GM2 Transaction log:

System Id: GM-2
Print Date: October 1, 2021 11:01:19 PM

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 1, 2021 12:43:35 PM	End	Execution	System Inspection and Basic Safety and Operation - 7890: Qualitative Test - No setpoints associated	Run Count: 1
October 1, 2021 12:47:37 PM	Start	Execution	Inlet Pressure Accuracy - Front MILK - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	None
October 1, 2021 12:47:42 PM	End	Execution	Inlet Pressure Accuracy - Front MILK - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	Run Count: 1
October 1, 2021 12:47:44 PM	Start	Execution	GC Oven Temperature Accuracy - 7890: Temperature : Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	None
October 1, 2021 12:48:34 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
October 1, 2021 12:48:55 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
October 1, 2021 12:48:57 PM	Start	Execution	GC Oven Temperature Accuracy - 7890: Temperature : Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	None
October 1, 2021 12:48:34 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
October 1, 2021 12:48:38 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

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Date:
System ID:

October 1, 2021 11:01:17 PM
GM-2

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User Name: supasak.nimsongtham
Host Name: SCG115HHC
ALS_GM2 Transaction log:

System Id: GM-2
Print Date: October 1, 2021 11:01:19 PM

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 1, 2021 12:48:35 PM	Start	Execution	GC Oven Temperature Stability - 7890: Temperature : Oven - S: 100.0°C - L: <= 0.5°C	None
October 1, 2021 12:49:34 PM	Audit	Data	GC Oven Temperature Stability - 7890: Temperature : Oven - S: 100.0°C - L: <= 0.5°C	Manual Data Entry
October 1, 2021 12:49:35 PM	End	Execution	GC Oven Temperature Stability - 7890: Temperature : Oven - S: 100.0°C - L: <= 0.5°C	Run Count: 1
October 1, 2021 12:49:37 PM	Start	Execution	Log Amp - 5975C Inlet XL with TAD SQ - Source: EI - Inlet	None
October 1, 2021 12:49:47 PM	End	Execution	Log Amp - 5975C Inlet XL with TAD SQ - Source: EI - Inlet	Run Count: 1
October 1, 2021 12:49:48 PM	Start	Execution	RPFA - 5975C Inlet XL with TAD SQ - Source: EI - Inlet	None
October 1, 2021 12:50:23 PM	End	Execution	RPFA - 5975C Inlet XL with TAD SQ - Source: EI - Inlet	Run Count: 1
October 1, 2021 12:50:25 PM	Start	Execution	Tune EI - 5975C Inlet XL with TAD SQ - Source: EI - Inlet	None
October 1, 2021 12:50:49 PM	End	Execution	Tune EI - 5975C Inlet XL with TAD SQ - Source: EI - Inlet	Run Count: 1
October 1, 2021 12:50:50 PM	Start	Execution	Tune EI - 5975C Inlet XL with TAD SQ - Source: EI - Inlet	None
October 1, 2021 12:50:59 PM	End	Execution	Tune EI - 5975C Inlet XL with TAD SQ - Source: EI - Inlet	Run Count: 1

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Date:
System ID:

October 1, 2021 11:01:17 PM
GM-2

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User Name: supasak.nhsongtham
Hostname: SCG115HKC
ALS_GM2 Transaction Log :

System ID: GM-2
Print Date: October 1, 2021 1:10:19 PM

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 1, 2021 12:51:01 PM	Start	Execution	Scouting Run - Injection Tower, Front MM, SQ - Source - EI - Inert-Part of GCMS System Preparation	None
October 1, 2021 12:51:16 PM	Audit	Data	Scouting Run - Injection Tower, Front MM, SQ - Source - EI - Inert-Part of GCMS System Preparation	Data File Path : E:\GM2002021\SCOUTING_RUN001.D\DATA.MS
October 1, 2021 12:51:42 PM	Audit	Data	Scouting Run - Injection Tower, Front MM, SQ - Source - EI - Inert-Part of GCMS System Preparation	Data File Path : E:\GM2002021\SCOUTING_RUN001.D\DATA.MS
October 1, 2021 12:52:42 PM	Audit	Data	Scouting Run - Injection Tower, Front MM, SQ - Source - EI - Inert-Part of GCMS System Preparation	Data File Path : E:\GM2002021\SCOUTING_RUN001.D\DATA.MS
October 1, 2021 12:53:25 PM	End	Execution	Scouting Run - Injection Tower, Front MM, SQ - Source - EI - Inert-Part of GCMS System Preparation	Run Count: 1
October 1, 2021 12:53:27 PM	Start	Execution	Signal to Noise EI - Injection Tower, Front MM, SQ - Source - EI - Inert using Flammant 1 - L >= 320	None
October 1, 2021 12:53:40 PM	Audit	Data	Signal to Noise EI - Injection Tower, Front MM, SQ - Source - EI - Inert using Flammant 1 - L >= 320	Data File Path : E:\GM2002021\SNF1_001.D\DATA.MS
October 1, 2021 12:53:56 PM	End	Execution	Signal to Noise EI - Injection Tower, Front MM, SQ - Source - EI - Inert using Flammant 1 - L >= 320	Run Count: 1

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User Name: supasak.nhsongtham
Hostname: SCG115HKC
ALS_GM2 Transaction Log :

System ID: GM-2
Print Date: October 1, 2021 1:10:19 PM

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 1, 2021 12:53:59 PM	Start	Execution	Signal to Noise EI - Injection Tower, Front MM, SQ - Source - EI - Inert using Flammant 2 - L >= 320	None
October 1, 2021 12:54:04 PM	Audit	Data	Signal to Noise EI - Injection Tower, Front MM, SQ - Source - EI - Inert using Flammant 2 - L >= 320	Data File Path : E:\GM2002021\SNF2_001.D\DATA.MS
October 1, 2021 12:54:22 PM	End	Execution	Signal to Noise EI - Injection Tower, Front MM, SQ - Source - EI - Inert using Flammant 2 - L >= 320	Run Count: 1
October 1, 2021 12:54:26 PM	Start	Execution	Injection Precision - Injection Tower, Front MM, SQ - Source - EI - Inert L (Area): <= 5.00% - L (Ret. Time): <= 1.00%	None
October 1, 2021 12:54:37 PM	Audit	Data	Injection Precision - Injection Tower, Front MM, SQ - Source - EI - Inert L (Area): <= 5.00% - L (Ret. Time): <= 1.00%	Data File Path : E:\GM2002021\IP_ARP003.D\DATA.MS
October 1, 2021 12:54:37 PM	Audit	Data	Injection Precision - Injection Tower, Front MM, SQ - Source - EI - Inert L (Area): <= 5.00% - L (Ret. Time): <= 1.00%	Data File Path : E:\GM2002021\IP_ARP004.D\DATA.MS
October 1, 2021 12:54:37 PM	Audit	Data	Injection Precision - Injection Tower, Front MM, SQ - Source - EI - Inert L (Area): <= 5.00% - L (Ret. Time): <= 1.00%	Data File Path : E:\GM2002021\IP_ARP005.D\DATA.MS
October 1, 2021 12:54:37 PM	Audit	Data	Injection Precision - Injection Tower, Front MM, SQ - Source - EI - Inert L (Area): <= 5.00% - L (Ret. Time): <= 1.00%	Data File Path : E:\GM2002021\IP_ARP006.D\DATA.MS

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User Name: suparak.nimsongtham
Hostname: SCG115HHC
ALS_GM2 Transaction Log :
System ID: GM-2
Print Date: October 1, 2021 1:10:19 PM

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 1, 2021 12:54:37 PM	Audit	Data	Injection Precision - Injection Tower, Front MM, SQ - Source: EI - Inlet 1 (Area): <= 5.00% - L (Rel. Time): <= 1.00% Data File Path : EXGM2002021UP_MRP007.DIDATA.MS	
October 1, 2021 12:54:37 PM	Audit	Data	Injection Precision - Injection Tower, Front MM, SQ - Source: EI - Inlet 1 (Area): <= 5.00% - L (Rel. Time): <= 1.00% Data File Path : EXGM2002021UP_MRP008.DIDATA.MS	
October 1, 2021 12:54:52 PM	End	Execution	Injection Precision - Injection Tower, Front MM, SQ - Source: EI - Inlet 1 (Area): <= 5.00% - L (Rel. Time): <= 1.00% Mass Ratio Precision - Injection Tower, Front MM, SQ - Source: EI - Inlet 1 (RSD): <= 5.00%	Run Count: 1
October 1, 2021 12:54:55 PM	Start	Execution	Mass Ratio Precision - Injection Tower, Front MM, SQ - Source: EI - Inlet 1 (RSD): <= 5.00%	
October 1, 2021 12:55:05 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MM, SQ - Source: EI - Inlet 1 (RSD): <= 5.00%	Data File Path : EXGM2002021UP_MRP003.DIDATA.MS
October 1, 2021 12:55:05 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MM, SQ - Source: EI - Inlet 1 (RSD): <= 5.00%	Data File Path : EXGM2002021UP_MRP004.DIDATA.MS
October 1, 2021 12:55:05 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MM, SQ - Source: EI - Inlet 1 (RSD): <= 5.00%	Data File Path : EXGM2002021UP_MRP005.DIDATA.MS
October 1, 2021 12:55:05 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MM, SQ - Source: EI - Inlet 1 (RSD): <= 5.00%	Data File Path : EXGM2002021UP_MRP006.DIDATA.MS

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Date:
System ID:October 1, 2021 1:10:17 PM
GM-2

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User Name: suparak.nimsongtham
Hostname: SCG115HHC
ALS_GM2 Transaction Log :
System ID: GM-2
Print Date: October 1, 2021 1:10:19 PM

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 1, 2021 12:55:05 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MM, SQ - Source: EI - Inlet 1 (RSD): <= 5.00%	Data File Path : EXGM2002021UP_MRP007.DIDATA.MS
October 1, 2021 12:55:05 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MM, SQ - Source: EI - Inlet 1 (RSD): <= 5.00%	Data File Path : EXGM2002021UP_MRP008.DIDATA.MS
October 1, 2021 12:55:10 PM	End	Execution	Mass Ratio Precision - Injection Tower, Front MM, SQ - Source: EI - Inlet 1 (RSD): <= 5.00%	Run Count: 1
October 1, 2021 12:55:13 PM	End	Qualification	Session	OO
October 1, 2021 12:55:13 PM	Start	Reporting	Session	None
October 1, 2021 1:55:11 PM	Audit	Reporting	Session	Report Generated : Certificate

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Date:
System ID:October 1, 2021 1:10:17 PM
GM-2
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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-TS1-75.17025
CALIBRATION 0394

Cert. No. : ACC22001
Pages : 1 of 3

Calibration Certificate

Equipment : SOUND CALIBRATOR
Manufacturer : RION
Model : NC-75
Serial No.: 35002736
ID No.: - 8.116 (0.003)

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 : 05 JANUARY 2022
Calibration Date : 10 JANUARY 2022
Date of Issue : 13 JANUARY 2022

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. : ACC22001
Job No. : VC65AC0040
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-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL.BP. 05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL.BP. 03/0264	08-Feb-22
Digital Multimeter	33461A	MY60024273	1-15180725251-1	15-Sep-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KA1	34560495	AA-3003-21	16-Feb-22
Audio Analyzer	AVR-3360A	V744B6069	EF-0010-21	10-Feb-22

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. : ACC22001
Job No. : VC65AC0040
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	93.99	-0.01	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 (%)
0.28	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, Bangbunru, Bangkok 10700 THAILAND.
Tel:0-2435-8800 Fax:0-2433-1679 e-mail:cal-center@sithiphorn.com http://www.sithiphorn.com

Cert. No. : ACL21119
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42/ Microphone UC-52 / Pre-amplifier NH-24
Serial No. : 01122579 / 172172 / 74022
ID No. : RYG_FS0018

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 : 21 SEPTEMBER 2021
Calibration Date : 04-06 OCTOBER 2021
Date of Issue : 11 OCTOBER 2021

Calibrated by : Nuthakorn Pisutpaism

Approved by : *T. Petchurai*
(Thanakul Petchurai)

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Continuation of Calibration Certificate

Cert. No. : ACL21119
Job No. : VC64AC0070
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 :

i. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL.BP. 05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL.BP. 03/0264	08-Feb-22
Digital Multimeter	8846A	1997025	EEL.BP. 06/0264	05-Feb-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KA1	34560495	AA-3003-21	16-Feb-22

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. : ACL21119
Job No. : VC64AC0070
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	✓	-	0.3	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	0.35
10. Peak C sound level	✓	-	0.2	0.25
11. Overload indication	✓	-	0.1	0.1
12. High level stability	✓	-	0.1	0.1

Continuation of Calibration Certificate

Cert. No. : ACL21119
Job No. : VC64AC0070
Pages : 4 of 8

Result of calibration i.

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.96)	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	19.5
Flat	26.2

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
125	0.2	0.3	0.2
1000	0.0	-0.1	0.0
8000	-1.0	-0.9	-0.9
			Acceptance Limits
			±1.5
			±1.0
			±5.0

Continuation of Calibration Certificate

Cert. No. : ACL21119
Job No. : VC64AC0070
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
63	-0.1	0.0	-0.1
125	0.0	0.0	-0.1
250	0.0	0.0	-0.1
500	0.0	0.0	-0.1
1000	0.0	0.0	0.0
2000	0.0	0.0	0.0
4000	0.0	0.0	0.0
8000	0.0	0.1	0.1
			Acceptance Limits
			±2.0
			±1.5
			±1.5
			±1.0
			±2.0
			±3.0
			±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

Continuation of Calibration Certificate

Cert. No. : ACL21119
Job No. : VC64AC0070
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	28.0	0.0	±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. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL21119
Job No. : VC64AC0070
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
	0.25	1	99.0	98.9	-0.1	1.5, -5.0
SEL	2	8	108.0	108.0	0.0	1.0, -2.5
	200	800	128.0	128.0	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	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	133.0	0.0	-
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL21119
Job No. : VC64AC0070
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

T. Petchurai

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Cert. No. : ACL21117
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42/ Microphone UC-52 / Preamplifier NH-24
Serial No.: 00233183 / 144835 / 23280
ID No.: RYG_FS0024

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 : 21 SEPTEMBER 2021
Calibration Date : 04-06 OCTOBER 2021
Date of Issue : 11 OCTOBER 2021

Calibrated by : Natthakorn Pisutpaisan

Approved by :

T. Petchurai
(Thanakul Petchurai)

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Continuation of Calibration Certificate

Cert. No. : ACL21117
Job No. : VC64AC0070
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	EP-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL.BP.05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL.BP.03/0264	08-Feb-22
Digital Multimeter	8846A	1997025	EEL.BP.06/0264	05-Feb-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	06-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KA1	34560495	AA-3003-21	16-Feb-22

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. : ACL21117
Job No. : VC64AC0070
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	✓	-	0.4	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. : ACL21117
Job No. : VC64AC0070
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.9G)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
22.9

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Measured value (dB)
A - weight	13.8
C - weight	19.7
Flat	25.4

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)		
	Flat	C-weight	A-weight
125	-0.1	-0.1	-0.1
1000	0.0	-0.1	0.0
8000	0.3	0.4	0.4

Continuation of Calibration Certificate

Cert. No. : ACL21117
Job No. : VC64AC0070
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
63	0.0	0.0	0.0
125	0.0	0.0	0.0
250	0.0	0.0	0.0
500	0.0	0.1	0.0
1000	0.0	0.0	0.0
2000	0.0	0.1	0.0
4000	0.0	0.0	0.0
8000	0.0	0.1	0.1

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
L eq	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

Continuation of Calibration Certificate

Cert. No. : ACL21117
Job No. : VC64AC0070
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±1.1
136.0	136.0	0.0	±1.1
135.0	135.0	0.0	±1.1
134.0	134.0	0.0	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.0	0.0	±1.1
114.0	114.0	0.0	±1.1
109.0	109.0	0.0	±1.1
104.0	104.0	0.0	±1.1
99.0	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
30.0	30.0	0.0	±1.1
29.0	29.1	0.1	±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	25.2	0.2	±1.1

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T. R. R. R.

Continuation of Calibration Certificate

Cert. No. : ACL21117
Job No. : VC64AC0070
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, T _b (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5; -5.0
	2	8	117.0	117.0	0.0	1.0; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.5; -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5; -5.0
SEL	2	8	108.0	108.0	0.0	1.0; -2.5
	200	800	128.0	128.1	0.1	±1.0

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	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	133.1	0.1	-
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

QF-TS12-04-04-020664

T. R. R. R.

Continuation of Calibration Certificate

Cert. No. : ACL21117
Job No. : VC64AC0070
Pages : 8 of 8

11. Overload Indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.5	-0.1	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$ or any value following calculation, providing a level of confidence of approximately 95%

End of Calibration Certificate

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

Cert. No. : ACL22114
Pages : 1 of 9

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-21/ Microphone UC-52 / Preamplifier NH-21
Serial No. : 00509355 / 143845 / 32731
ID No. : RYG_FS0015

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 : 17 MAY 2022

Calibration Date : 24-27 MAY 2022

Date of Issue : 30 MAY 2022

Calibrated by :

Nathakorn Pisulpaisan

Approved by :

T. Petchurai
(Thanakul Petchurai)

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Continuation of Calibration Certificate

Cert. No. : ACL22114
Job No. : VC65AC0060
Pages : 2 of 9

Calibration Procedure : CP-AC-02

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 test 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	8846A	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. : ACL22114
Job No. : VC65AC0060
Pages : 3 of 9

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. : ACL22114
Job No. : VC65AC0060
Pages : 4 of 9**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)
21.7

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Measured value (dB)
A - weight	21.5
C - weight	22.6
Flat	25.5

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
125	0.3	0.4	0.4
1000	0.0	0.0	0.0
8000	-1.1	-1.0	-0.9
			Acceptance Limits
			± 1.5
			± 1.0
			± 5.0

Continuation of Calibration Certificate

Cert. No. : ACL22114
Job No. : VC65AC0060
Pages : 5 of 9**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
63	-0.1	-0.1	0.0
125	-0.1	0.0	0.0
250	-0.1	0.0	-0.1
500	0.0	0.0	-0.1
1000	0.0	0.0	0.0
2000	0.1	0.1	0.1
4000	0.1	0.1	0.1
8000	0.1	0.2	0.2
			Acceptance Limits
			± 2.0
			± 1.5
			± 1.5
			± 1.0
			± 2.0
			± 3.0
			± 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

Continuation of Calibration Certificate

Cert. No. : ACL22114
Job No. : VC65AC0060
Pages : 6 of 9

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
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	113.9	-0.1	± 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	49.1	0.1	± 1.1
44.0	44.1	0.1	± 1.1
39.0	39.4	0.4	± 1.1

Continuation of Calibration Certificate

Cert. No. : ACL22114
Job No. : VC65AC0060
Pages : 7 of 9

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	± 0.5
120	94.0	94.0	0.0	± 0.5
110	94.0	94.0	0.0	± 0.5
100	94.0	94.0	0.0	± 0.5
90	94.0	94.0	0.0	± 0.5

Level linearity on each level range

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	43.0	43.0	0.0	± 0.5
120	33.0	33.0	0.0	± 0.5

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	134.1	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	128.0	0.0	± 1.0

Continuation of Calibration Certificate

Cert. No. : ACL22114
Job No. : VC65AC0060
Pages : 8 of 9

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	136.3	-0.1	±3.0

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

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle	-0.1	±1.5
89.4	89.3		

Continuation of Calibration Certificate

Cert. No. : ACL22114
Job No. : VC65AC0060
Pages : 9 of 9

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

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

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



NSC-TS1-715 17025
CALIBRATION 0394

Cert No. : ACC22013
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,
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 : 22 APRIL 2022

Calibration Date : 26 APRIL 2022

Date of Issue : 29 APRIL 2022

Calibrated by :

Nathakorn Pisulpaisan

Approved by :

T. Petchurai
(Thanakul Petchurai)

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SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert No. : ACC22013
Job No. : VC65AC0054
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).

QF-TS12-04-04-020664

T. Petchurai

Continuation of Calibration Certificate

Cert. No. : ACC22013
Job No. : VC65AC0054
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	94.11	0.11	0.14	0.40

2. Frequency

Specified Frequency (Hz)	Measured value (Hz)	Deviated value (%)	Uncertainty (%)	Tolerance limit (%)
1000	1003.1	0.3	0.1	1.0

3. Total distortion

Measured value (%)	Uncertainty (%)	Tolerance limit (%)
2.02	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

Y. Petchurai

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

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

Cert. No. : ACL22032
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42/ Microphone UC-52 / Preamplifier NH-24
Serial No.: 01222724 / 143842 / 22771
ID No.: RYG_FS0023

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 : 05 JANUARY 2022
Calibration Date : 10-12 JANUARY 2022
Date of Issue : 13 JANUARY 2022

Calibrated by :

Nathakorn Pisutpaisan

Approved by :

Y. 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.

REVIEW BY	<i>Nathakorn P.</i>
APPROVED BY	<i>Y. Petchurai</i>
NEXT CAL DATE	10/1/23

Continuation of Calibration Certificate

Cert. No. : ACL22032
Job No. : VC6SAC0040
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 test 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-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL.BP. 05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL.BP. 03/0264	08-Feb-22
Digital Multimeter	34461A	MY60024273	1-15180725251-1	15-Sep-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KAI	34560495	AA-3003-21	16-Feb-22

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. : ACL22032
Job No. : VC6SAC0040
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. : ACL22032
Job No. : VC65AC0040
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.96)	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	12.8
C - weight	19.5
Flat	25.0

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	0.4	0.4	± 1.5
1000	0.0	0.0	± 1.0
8000	-1.0	-0.9	±5.0

Continuation of Calibration Certificate

Cert. No. : ACL22032
Job No. : VC65AC0040
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	±2.0
125	-0.1	0.0	±1.5
250	0.0	0.0	±1.5
500	0.0	0.0	±1.5
1000	0.0	0.0	±1.0
2000	0.0	0.0	±2.0
4000	0.0	0.0	±3.0
8000	0.0	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

Continuation of Calibration Certificate

Cert. No. : ACL22032
Job No. : VC65AC0040
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±1.1
136.0	136.0	0.0	±1.1
135.0	135.0	0.0	±1.1
134.0	134.0	0.0	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.0	0.0	±1.1
114.0	114.0	0.0	±1.1
109.0	109.0	0.0	±1.1
104.0	104.0	0.0	±1.1
99.0	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
30.0	30.0	0.0	±1.1
29.0	28.9	-0.1	±1.1
28.0	27.9	-0.1	±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

QF-TS12-04-04-020664

T. R. R. R.

Continuation of Calibration Certificate

Cert. No. : ACL22032
Job No. : VC65AC0040
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	136.4	0.0	±3.0

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

QF-TS12-04-04-020664

T. R. R. R.

Continuation of Calibration Certificate

Cert. No. : ACL22032
Job No. : VC65AC0040
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	89.4	-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 Sirthorn Rd, Bangbunru, Bangkok 10700 THAILAND.
Tel:0-2435-8800 Fax:0-2433-1679 e-mail:center@sithphorn.com http://www.sithphorn.com

Cert. No. : ACL22062
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42/ Microphone UC-52 / Preamplifier NF-24
Serial No.: 01222723 / 143841 / 22770
ID No.: RYG_FS0022

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 : 14 JANUARY 2022
Calibration Date : 21-24 JANUARY 2022
Date of Issue : 25 JANUARY 2022

Calibrated by :

Nathakorn Pisupaisam

Approved by :

T. Reth.
(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. : ACL22062
Job No. : VC65AC0043
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-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL-BP-05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL-BP-03/0264	08-Feb-22
Digital Multimeter	34461A	MY60024273	I-15180725251-1	15-Sep-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KA1	34560495	AA-3003-21	16-Feb-22

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. : ACL22062
Job No. : VC65AC0043
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. : ACL22062
Job No. : VC65AC0043
Pages : 4 of 8

Result of calibration:

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.96)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.8

2.2 The microphones of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Measured value (dB)
A - weight	12.0
C - weight	18.0
Flat	24.1

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
125	0.4	0.4	0.4
1000	-0.1	-0.1	-0.1
8000	-0.4	-0.3	-0.3

Continuation of Calibration Certificate

Cert. No. : ACL22062
Job No. : VC65AC0043
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
63	-0.1	0.0	-0.1
125	0.0	0.0	0.0
250	0.0	0.0	0.0
500	0.0	0.0	0.0
1000	0.0	0.0	0.0
2000	0.0	0.0	0.0
4000	0.0	0.0	0.0
8000	0.0	0.1	0.1

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

Continuation of Calibration Certificate

Cert. No. : ACL22062
Job No. : VC65AC0043
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±1.1
136.0	136.0	0.0	±1.1
135.0	135.0	0.0	±1.1
134.0	134.0	0.0	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.0	0.0	±1.1
114.0	114.0	0.0	±1.1
109.0	109.0	0.0	±1.1
104.0	104.0	0.0	±1.1
99.0	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
30.0	30.0	0.0	±1.1
29.0	29.0	0.0	±1.1
28.0	28.0	0.0	±1.1
27.0	27.1	0.1	±1.1
26.0	26.1	0.1	±1.1
25.0	25.1	0.1	±1.1

Continuation of Calibration Certificate

Cert. No. : ACL22062
Job No. : VC65AC0043
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
	0.25	1	99.0	98.9	-0.1	1.5, -5.0
SEL	2	8	108.0	108.0	0.0	1.0, -2.5
	200	800	128.0	128.0	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	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

Continuation of Calibration Certificate

Cert. No. : ACL22062
Job No. : VC65AC0043
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.6	0.0	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$ or any value following calculation providing a level of confidence of approximately 95 %

_____ End of Calibration Certificate _____



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TEL. 0-2717-3000-27 FAX. 0-2719-9484



Cert.No.: 22CH405
Page: 1 of 3

Certificate of Calibration

Equipment : pH Meter
Manufacturer : Mettler Toledo
Model : Seven Compact S220
Serial No. : C104059460
ID No. : RYG_EN0183
Condition As-Received:
Received Date : 16 March 2022
Calibration Date : 17 March 2022
Reference : 2203-0611DSC-4
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.
Rayong Branch
616/10 Moo 5 T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand

REVIEW BY	<i>N. Bomyit</i>
APPROVED BY	<i>P. J.</i>
NEXT CAL. DATE	17/3/23

Ambient Temperature :
Relative Humidity :
Calibration Procedure :

(25 ± 2.5) °C
(50 ± 15) %
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

Calibrated by : Warakorn Lerngagrakul

Approved by : *Malee*
Approved Signatory

(✓) Malee Butkuea
() Sathip Meangmai
() Warakorn Lerngagrakul

Issue Date : 22 March 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 3 : Equipment Calibration and Testing Services.



Cert.No.: 22CH405
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 21E2882 25 Aug 2022
2) Ref. Standard Thermometer 4982054 110RC044 2111201 26 Oct 2022
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.	Expo. date
pH 4.008	CPA chem	788995	01 Jan 2024
pH 6.982	CPA chem	761017	02 Aug 2022
pH 10.015	CPA chem	766924	04 Sep 2022

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 Fluks at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (+mV)	Coverage factor k
			mV	pH		
pH Meter SN.: 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

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a 1100955



Cert.No.: 22CH405
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 SN.: 1453404	4.008	4.010	177.7	0.0046	2.00
	6.982	6.988	3.6	0.0084	2.00
	10.015	10.010	-172.9	0.0073	2.05

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : InLab Expert Pro-ISM

- Serial No. : 1453404

Dimension of probe;

- Length : 120 mm.

- Diameter : 12 mm.

- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (\pm °C)	Coverage factor k
25.0	25.002	24.9	-0.102	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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Modu.

a 1100954



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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NSC-1817-1723
CALIBRATION 2028

Certificate of Calibration

Certificate No.: 22E986

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: 18 March 2022
Calibration Date: 21 March 2022

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.

Reference: 2203-0811DSC
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 10) %
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 was 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:

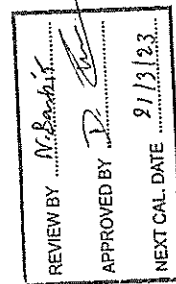
Instrument	Model	Serial No.	Certificate No.	Due Date
1) Multi-Product Calibrator	5500A	6440007	21E1444	07 May 2022

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: Pongsang Boonyaporn
Issue Date: 22 March 2022

Approved Signatory:
[Signature]
Phallinee Prabpaipal
[Signature]
Nuntawat Khamchai
[Signature]
Ponthipha Tameyakul

B 0284414



Cert. No.: 22E986

Page: 2 of 2

Result of calibration :- (*) Without adjustment () After adjustment

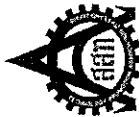
Function:	DC voltage measurement	Range:	2000	mV
	Standard Value	UUC* Reading	Error	Uncertainty
	(mV)	(mV)	(mV)	(± μV)
	-200.0000	-200.0	0.0	72
	-150.0000	-150.0	0.0	69
	-100.0000	-100.0	0.0	65
	-50.0000	-50.0	0.0	62
	0.0000	0.0	0.0	58
	50.0000	50.0	0.0	62
	100.0000	100.0	0.0	65
	150.0000	150.0	0.0	69
	200.0000	200.0	0.0	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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a 1101070



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Cert.No.: 22TW34

Page: 1 of 2

Certificate of Testing

Equipment : DO Meter

Manufacturer :

Model : YSI 5000-11SV

Serial No. : 15E102796

ID No. : RYG_EN0032

Received Date : 11 February 2022

Test Date : 14 February 2022

Reference : 2202-0404DSC-4

Submitted by : ALS Laboratory Group (Thailand) Co., Ltd.
(Rayong Branch)
616/10 Moo 5 T.Maenam Khu. A.Pluaekdaeng,
Rayong 21140, Thailand

Laboratory Condition :

Temperature (25 ± 5) °C

Humidity (50 ± 20) %

In - house method : CP-CH9

by Comparison Technique with Azide Modification Method

Test Procedure :

Tested by :

Walalak Sirithean

Approved by :

Saithip
Approved Signatory

() Malee Butkruea

(☒) Saithip Meangmai

() Warakorn Lengaglakrui

Issue Date :

18 February 2022



Cert.No.: 22TW34

Page: 2 of 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)
8.02	8.02	0.0084

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 1094744

B 0281285



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TEL: 0-2717-3000-27 FAX: 0-2719-0464



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Cert. No.: 22LM12
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)
618/10 Moo 5 T. Maenam Khu. A. Pluakdaeng,
Rayong 21140, Thailand
Location : TPA On Site Calibration Laboratory

Received Order : 11 February 2022
Calibrated Date : 21 February 2022
Ambient Temperature : $(26 \pm 10) ^\circ\text{C}$
Relative Humidity : $(50 \pm 30) \%$
AC Line Voltage : $(220 \pm 22) \text{ V}$

Calibrated by : Kunchit Promprat

Approved by : 
Approved Signatory

() Pornthippa Taneyakul
(✓) Malee Bulkruea
() Suwit Imjai

Issue Date : 21 February 2022

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.

A 0038008



Equipment : DO Meter with Sensor
Condition As-Received : Used Item
Reference : 2202-0404DSC-5
Procedure Used :-

Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with
Industrial Platinum Resistance Thermometer (IPT) 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 1523 2188080 211273 22 Nov 2022
2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certificate is traceable to the International System of Unit.

Result of Calibration :- (*) Without Adjustment

Function : Temperature measurement

This instrument was connected with temperature sensor, S/N.: 15E100464

Calibration Point ($^{\circ}\text{C}$)	Immersion Depth (mm)	Standard Temperature ($^{\circ}\text{C}$)	UUC* Reading ($^{\circ}\text{C}$)	Error ($^{\circ}\text{C}$)	Uncertainty ($\pm ^{\circ}\text{C}$)	Coverage Factor k
20.00	45	20.001	19.88	-0.121	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-



a 1095714



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TEL. 0-2717-3003-27 FAX. 0-2719-9484

Certificate of Calibration

Cert. No.: 22TM317
Page.: 1 of 3

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. Phukdaeng, Rayong 21140, Thailand
Location : BOD Room

Received Order : 22 April 2022
Calibration Date : 22 April 2022
Ambient Temperature : $(26 \pm 10) ^\circ\text{C}$
Relative Humidity : $(50 \pm 30) \%$

Calibrated by : Man Pattanapongpaitoon

Approved by :
Approved Signatory

() Pornthippa Taneyakul
() Malee Butkruea
() Suwit Imjai

Issue Date : 3 May 2022

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.

A 0040735



Equipment : Low Temp. Incubator
Condition As-Received : Used Item
Reference : 2204-01460C-1

Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement
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 MY4031769 21LM12 02 Sep 2022

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

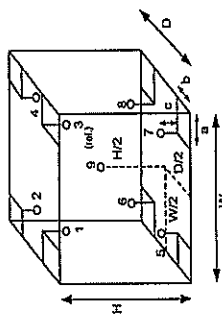
3. This certificate is traceable to the International System of Unit.

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close

Environment during calibration	
Beginning	Finished
Temp. ($^\circ\text{C}$)	25
REL.Humid. (%)	54
AC Supply (Volt)	221
	223



Probe Installation Details :

a = 10 cm
b = 10 cm
c = 10 cm
D = 0.60 m
W = 1.0 m
H = 1.2 m
Capacity = 0.75 m^3

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

a 1106485



Cert. No.: 22TM317
Page: 3 of 3

Equipment: Low Temp. Incubator
Condition As-Received: Used Item
Reference: 2204-0146OC-1
Result of Calibration: (°) Without Adjustment
Function of UUC*: Temperature Source
Fresh air setting: Close

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Uncertainty (± °C)	Coverage Factor k
20.0	20.0	20.0	0.022	0.20	0.22	0.30	2
Measured Temperature (°C)							
Calibration Point (°C)	Position						
20.0	1	2	3	4	5	6	7
	20.209	20.174	20.199	20.110	20.075	20.062	20.027
							20.069
							20.030

Average*: The average of 30 values in each position.
Temperature stability: One-half of the greatest maximum difference of measured temperature at any one sensor.
Temperature uniformity: The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Overall Variation: The Difference of the maximum and minimum measured temperatures throughout observation.
UUC*: Unit Under Calibration
Note: The reported uncertainty of measurement was included stability and excluded uniformity.
The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

-00-

Walu

a 1106484



Certificate of Calibration

Equipment: SPECTROPHOTOMETER
Model: DR6000
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 *M. Banist*
APPROVED BY *D. E.*
NEXT CAL. DATE 27/13/24
3.2 %RH

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 Fothong
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 Stama 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

[Signature]
(Mr. Chattuphon Fothong)
Person in charge

[Signature]
(Mr. Thalemgieat 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.

John Kenneth Pichai Srisa
DKSH Technology Limited
2553 Nongyuan Intersection, Bangna-Prachinburi Road, Bangna, Bangkok 10260
Phone: +66 289 1700 Email: info.calibration@dksh.com Website: www.dksh.com/scientific-thailand

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CALFW-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
420 nm	0.0000	0.000	0.0000	0.0045
	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
	1.0312	1.034	-0.0028	0.0045
465 nm	0.0000	0.000	0.0000	0.0045
	0.5024	0.506	-0.0036	0.0045
	0.6683	0.672	-0.0027	0.0045
	0.9604	0.964	-0.0036	0.0045
546.1 nm	0.0000	0.000	0.0000	0.0045
	0.5168	0.519	-0.0022	0.0045
	0.6903	0.691	-0.0007	0.0045
	0.9904	0.992	-0.0016	0.0045
590 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
635 nm	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



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 (%)	Absorbance (A)
260.87 +/- 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



ใบตรวจสอบสภาพเครื่องวัดสิ่งแวดล้อม

ชนิดเครื่องวัด: SPECTROPHOTOMETER รุ่น: DR6000 เลขที่ใบงาน: KSPR2212224 หมายเลขเครื่อง: 1627845

ตรวจสอบ (วัน)		รายการตรวจวัด	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 checked="" type="checkbox"/>	<input type="checkbox"/>	6. แรงดันไฟฟ้า (Battery Backup) >= 2.5 VDC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7. ส่วนหนึ่งเลือกความยาวคลื่น (Wavelength Control)	<input checked="" 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 ถึง 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. ช่องวัดหลายสีอย่าง (Carousel Module)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		pH Meter and Conductivity Meter			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	12. อิเล็กโทรด (Electrode and Connection Cable)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	13. ระดับความสะอาดใน Electrode (Level KCl)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	14. ฝาปิดป้องกัน Electrode (Dust Protection Hood)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	15. ขาตั้งอิเล็กโทรด (Stand)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		Turbidimeter			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	16. ค่าความขุ่นที่ต่ำสุด (No Sample)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	17. ระดับการล้างตัวอย่างแสง (>= 2.5 ไม่นาน 3.0)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		Automatic titrator			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	18. สภาพ Piston Burettes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	19. Function Rinsing and Dosing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	20. ระบบล้างยานพาหนะอุปกรณ์ประกอบ	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

เห็นด้วยและลงนาม:

Mr. Chaituphon Falthong
Service Engineer

DKSH Technology Limited
2533 หมู่บ้านอุตสาหกรรมจากเทศบาลนครกรุงเทพมหานคร 10250
2533 Sukhumvit Road, Bangkok, Prachinwong, Bangkok 10250
Phone: +66 2659 7000 Email: info@dksh.co.th Website: www.dksh.com/thailand-thailand

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CAL-FM-R31-03: 20 Jul 2022



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Tel: +66 (0) 2699-9773
www.pentalab.com

Certificate of Calibration

Represent to Certificate of Calibration_PTC07/22103

Certificate No.: PTC07/22103 Page: 1 of 2
Equipment: Digital Balance Condition: Normal
Manufacturer: Sartorius Serial No: 26207038
Model: MSE2245-100-DJ ID No: RYG_END002
Type of Balance: Single interval

Customer: ALS Laboratory Group (Thailand) Co., Ltd.
616/10 Moo 5 T. Maenamkoo, A.Pluakdaeng,
Rayong 21140, Thailand

Environment Condition: Temperature 23.9 °C ± 0.3 °C
Humidity 58.1 %RH ± 4.4 %RH
Air density 1.17 kg/m³

Calibration Place: ALS Laboratory Group (Thailand) Co., Ltd.
616/10 Moo 5 T. Maenamkoo, A.Pluakdaeng,
Rayong 21140, Thailand

The Method used: In house method, PTC-WI-07, base on Euramet cg. 18
Traceability: This certificate is traceable to the SI Units through Thai Calibration Service Co., Ltd.
NSC-ONSC Accreditation No.: Calibration 0189

Date Received: March 23, 2022
Calibration Date: March 23, 2022
Issued Date: March 25, 2022
Calibration By: Mr. Rungroje Melakul

Reviewed by: (Mr. Kiangsak Kalasri)
Approved By: (Mr. Keattisak Kerdlo)

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 recognised 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). The effect that the results relate only to the items calibrated.

This calibration certificate shall not be reproduced except in full only, without written approval from penta calibration co., ltd

PTC-FM-R31-03: 21 Feb 2020

RYG_END002



PENTA CALIBRATION

PENTA CALIBRATION CO., LTD.
66/124 The Connect 33 Village Kanchanaphisek Road
Dokmai Praveh Bangkok 10250
Tel: +66 (0) 2669-9773
www.pentacal.com

Represent to Certificate of Calibration :PTC/07/22103

Certificate No.: PTC/07/22103

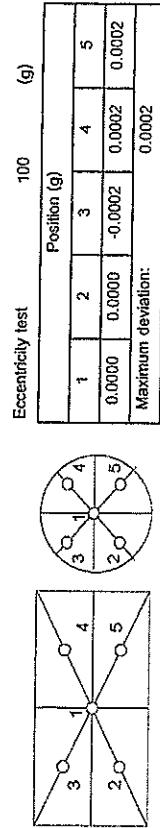
Measurement Results:

Without Adjustment :

Function Calibration: Non Adjustment

Eccentric Error: Weight to be 1/3, 1/2 or of Maximum capacity

Page: 2 of 2



Repeatability Test : Weight to be $1/2 \leq L_1 \leq$ Maximum capacity

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

Nominal test value (g)	Standard Deviation
200	0.00003

Error of indication : from nominal value., Readability 0.0001 (g)

Nominal Value (g)	Conventional Mass (g)	Indication (g)	Correction of Balance (g)	Uncertainty (g)	k
0	0.00000	0.0000	0.0000	0.000086	2.16
0.01	0.01000	0.0100	0.0000	0.00010	2.06
0.1	0.10000	0.1000	0.0000	0.00010	2.06
1	1.00000	1.0000	0.0000	0.00010	2.06
2	2.00000	1.9999	0.0001	0.00010	2.06
5	5.00001	5.0000	0.0000	0.00010	2.06
10	10.00000	10.0000	0.0000	0.00010	2.06
20	20.00003	19.9999	0.0001	0.00011	2.05
50	50.00004	49.9999	0.0001	0.00012	2.00
100	100.00004	100.0001	-0.0001	0.00017	2.00
200	200.00011	200.0000	0.0001	0.00027	2.00

Note: Weight of adjust (g)

The End of Certificate

RYG_EN0010



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
55/41 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3081-37 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. : GS11.1572

ID No. : RYG_EN0010

Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
816/10 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 ± 10) °C

Relative Humidity : (50 ± 30) %

Calibrated by : Man Paltanapongpalboon

Approved by :
Approved Signatory

() Ponthippa Tameyakul

(x) Malee Bukruea

() Suwit Injai

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 3 : Equipment Calibration and Testing Services.

A 0046908



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2210-03760C-2
Cert. No.: 22TM1517
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) 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.

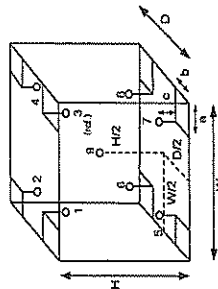
3. This certification is traceable to the International System of Unit.

Result of Calibration :-

Function of Calibration :- Temperature Source

Function of UUC* : Close

Fresh air setting : Close



Probe Installation Details :

a = 5.0 cm
b = 5.0 cm
c = 5.0 cm
Dimension of Chamber :
D = 0.40 m
W = 0.56 m
H = 0.48 m
Capacity = 0.11 m³

Environment during calibration		
Temp. (°C)	Beginning	Finished
REL.Humid. (%)	25	25
AC Supply (Volt)	54	59
	223	225

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
Cert. No.: 22TM1517
Page : 3 of 3
Result of Calibration :- Temperature Source
Function of UUC* : Close
Fresh air setting : Close

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

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	103.740	103.747
180.0	179.723	179.359	179.439	179.489	180.361	180.114	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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Modu

a 1132465



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
53/44 PATTANAKARN ROAD SOI 18, SUANLIANG, SUANLIANG BANGKOK 10250
TEL. 0-2717-3880-37 FAX. 0-2719-9184



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_END0006

REVIEW BY	Thawit
APPROVED BY	P. K.
NEXT CAL. DATE	30.10.2022

Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
616/10 Moo 5, T. Maenam Khu,
A. Phukdaeng,
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 Hahib

Approved by: Approved Signatory

() Pornthippa Taneyakul
(x) Malee Bulkruea
() Suwit Injai

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 3: Equipment Calibration and Testing Services.



Equipment: Hot Air Oven
Condition As-Received: Used Item
Reference: 2210-03760C-1

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	34970A	MY44035217	21LM30	23 Dec 2022

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

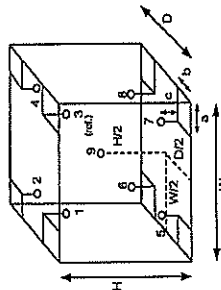
3. This certification is traceable to the International System of Unit.

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close

Environment during calibration		
	Beginning	Finished
Temp. (°C)	28	29
REL Humid. (%)	43	47
AC Supply (Volt)	220	221



Probe Installation Details :

a =	5.0	cm	D =	0.33	m	
b =	5.0	cm	W =	0.40	m	
c =	5.0	cm	H =	0.40	m	
				Capacity =	0.053	m ³

Dimension of Chamber :

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 :-

Function of UUC*: Temperature Source

Fresh air setting: Close

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Uncertainty (±°C)	Coverage Factor <i>k</i>
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	70.686	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 senso

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

UUC* : Unit Under Calibration
Note : The reported uncertainty of measurement was included stability and excluded uniformity .

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

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLIANG, SUANLIANG BANGKOK 10250
TEL. 0-2717-3000-27 FAX. 0-2719-9484

NSC-T181-T1817D25
CALIBRATION 9000

Cert. No.: 22TM1491
Page: 1 of 3

Certificate of Calibration

Equipment:

Manufacturer: Memmert

Model : WNB22

Serial No.: L513.0848

ID No.: RYG_EN00061

Submitted by :

ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
616/10 Moo 5, T. Maenam Khu,
A. Phuakdaeng,
Rayong 21140, Thailand

Location : Wet Chemistry Lab

Received Order : 20 October 2022

Calibration Date : 20 October 2022

Ambient Temperature : $(26 \pm 10)^{\circ}\text{C}$

Calibrated by : Preecha Hlahib

Approved by : _____
Approved Signatory

☐ Pomthippa Tameyakul
☒ Malee Butkruea
☐ Suwit Imjai

Issue Date : 2 November 2022

The Uncertainties are for a confidence probability of approximately 95%

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Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2210-0376OC-4
Cert. No.: 22TM1491
Page : 2 of 3

Procedure Used :-

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

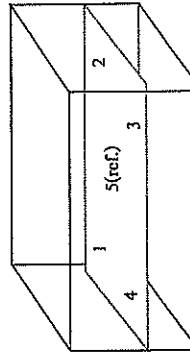
2. This certificate is valid only to the item calibrated on date and place of calibration.

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 (Volt)
	(°C)	(%R.H.)	
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

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Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2210-0376OC-4
Cert. No.: 22TM1491
Page : 3 of 3
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source

Calibration point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Average* Standard Reading (°C)				
			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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CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES
534/1 PATTANAKARN ROAD SOI 18, SUKHLIANG, SIAMLIANG, HANGKOR 10256
TEL. 0-2117-3000-27 FAX. 0-2119-8434



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534/1 PATTANAKARN ROAD SOI 18, SUKHLIANG, SIAMLIANG, HANGKOR 10256
TEL. 0-2117-3000-27 FAX. 0-2119-8434

Cert.No.: 22CH377
Page: 1 of 2

Certificate of Calibration

Equipment : pH Meter

Manufacturer : Mettler Toledo

Model : Seven2Go

Serial No. : B531256371

ID No. : RYG_FS0420

Condition As-Received: Used Item

Received Date : 11 March 2022

Calibration Date : 14 March 2022

Reference : 2203-0495DSC-1

Submitted by : ALS Laboratory Group (Thailand) Co., Ltd. Rayong Branch

518/10 Moo 5 T.Maenam Khu,

A.Pluakdaeng, Rayong 21140, Thailand

(25 ± 2.5) °C

(50 ± 15) %

In - house method :

- CP-CH5 by direct measurement with standard

voltage calibrator and direct measurement

with certified reference material (CRM)

Calibrated by :

Warakorn Lemgagrakul

Approved by :

Approved Signatory

(✓) Malee Bulkruea

() Sathip Meangmai

() Warakorn Lemgagrakul

Issue Date :

17 March 2022

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.

A 0039308



Cert. No.: 22CH377
Page: 2 of 2

Condition of this calibration result

1. Reference Standard Instrument :-

Instrument ID No. Cert. No. Due Date

1) Document Process Calibrator 54030049 130RC116 21E2682 25 Aug 2022

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 766820 23 Sep 2023

pH 6.983 CPA chem 766822 04 Sep 2022

pH 10.015 CPA chem 766824 04 Sep 2022

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
			mV	pH		
pH Meter S/N: B531256371	pH	mV				
	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)

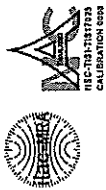
Unit Under Calibration	Standard Buffer Solution	Standard pH	Actual pH Reading		Uncertainty of pH measurement (±)	Coverage factor k
			Reading (mV)	Actual pH		
pH Electrode S/N: 1311407	4.008		4.01	191	0.0079	2.00
	6.983		6.98	7	0.0093	2.00
	10.015		10.01	-171	0.0092	2.00

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 %.

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TEL. 0-2717-3000-27 FAX. 0-2719-4354



Cert. No.: 22LM41
Page.: 1 of 2

Certificate of Calibration

Equipment : pH Meter with Sensor
Manufacturer : Mettler Toledo
Model : Seven2Go
Serial No. : B531256371
ID No. : RYG_FS0420

Submitted by : ALS Laboratory Group (Thailand) Co., Ltd.
(Rayong Branch)
616/10 Moo 5 T. Maenam Khu. A. Phukdaeng,
Rayong 21140 Thailand
Location : TPA On Site Calibration Laboratory

Received Order : 11 March 2022
Calibrated Date : 15 March 2022
Ambient Temperature : $(26 \pm 10) ^\circ\text{C}$
Relative Humidity : $(50 \pm 30) \%$
AC Line Voltage : $(220 \pm 22) \text{ V}$

Calibrated by : Malee Bulkruea

Approved by : 
Approved Signatory

() Ponthippa Tameyakul
(✓) Suwit Injai

Issue Date : 17 March 2022

The Uncertainties are for a confidence probability of approximately 95 %

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

A 0039307



Equipment : pH Meter with Sensor
Condition As-Received : Used Item
Reference : 2203-049SDSC-2

Cert. No.: 22LM41
Page.: 2 of 2

Procedure Used :-

Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer (IPRT) into Temperature Bath.

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument Model Serial No. Cert. No. Due Date
1) Digital Thermometer 1523 2188080 211273 22 Nov 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 : Temperature measurement

This instrument was connected with temperature sensor, S/N: 1311407

Calibration Point ($^{\circ}\text{C}$)	Immersion Depth (mm)	Standard Temperature ($^{\circ}\text{C}$)	UUC* Reading ($^{\circ}\text{C}$)	Error ($^{\circ}\text{C}$)	Uncertainty ($\pm ^{\circ}\text{C}$)	Coverage Factor k
25.0	100	25.009	25.4	0.391	0.16	2.00
30.0	100	30.008	30.5	0.492	0.16	2.00
40.0	100	39.997	40.6	0.603	0.16	2.00
50.0	100	49.997	50.6	0.603	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 %.

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Certificate of System Qualification

GC-QQ + GCMS-QQ

System ID: GM-7
Organization Name: ALS Laboratory Group (Thailand) Co., Ltd.
Organization Location: 104 Pathanakarn rd., Khwang Suan Luang, Khet Suan Luang, Bangkok 10250
Date: June 21, 2022 2:04:12 PM
EQP Name: Agilent/Recommended, Agilent/Recommended
EQP Revision: GC.02.50, GCMS.02.50
Overall Qualification Status: Pass

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 SSL
Setpoint Status: Pass
Inlet Pressure: 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: June 21, 2022 2:04:12 PM
System ID: GM-7

Setpoint Status: Pass
Zone: Oven

Temperature: 230.0 °C

Accuracy: 0.0 °C

Agilent Recommended: ≥ -1.0 °C
≤ 1.0 °C

Setpoint Status: Pass
Zone: Oven

Temperature: 100.0 °C

Accuracy: 0.4 °C

Agilent Recommended: ≥ -1.0 °C
≤ 1.0 °C

Overall GC Oven Temperature Accuracy Test Status

Pass

GC Oven Temperature Stability

Name: 7890

Setpoint Status: Pass

Temperature: 100.0 °C

Stability: 0.1 °C

Agilent Recommended: ≤ 0.5

Overall GC Oven Temperature Stability Test Status

Pass

Log Amp

Tested Combination1 Front SSL / External SQ
Name: 5977A

Setpoint Status: Pass

Date: June 21, 2022 2:04:12 PM
System ID: GM-7

Overall Log Amp Test Status

Pass

RPPA

Tested Combination1 Front SSL / External SQ
Name: 5977A

Setpoint Status:

Pass

Ampl: 1000 mV

Drift After Five Minutes:

22 mV and -100 mV and 100 mV

RPPA Voltage: 568 mV

Agilent Recommended:

Pass

Overall RPPA Test Status

Pass

Tune EI

Tested Combination1 Front SSL / External SQ
Name: 5977A

Setpoint Status:

Pass

Filament: 1

Setpoint Status:

Pass

Filament: 2

Overall Tune EI Test Status

Pass

Signal to Noise EI

Tested Combination1 Front SSL / External SQ
Name: 5977A

Source: EI - Extractor Filament: 1

Setpoint Status:

Pass

Signal to Noise: 51283

Agilent Recommended:

Pass

>= 1200

Source: EI - Extractor Filament: 2

Setpoint Status:

Pass

Signal to Noise: 7088

Agilent Recommended:

Pass

>= 1200

This test's 0 comment(s) and 1 deviation(s) are available in the Attachments section.

Overall Signal to Noise EI Test Status

Pass

Instrument Details

Purpose
This section describes the as found system configuration.

Details

System	
System ID	GM-7
Manufacturer	Agilent Technologies
Name	7890

Tested Combination1	
Injection Technique	Manual Injection
Inlet	Front
Detector	External
LTM Included?	No

Sampler 1	
Manufacturer	Agilent Technologies
Type	Manual Injection
Usage	Sample Injection
Syringe Volume (µL)	10

Mainframe 1	
Manufacturer	Agilent Technologies
Name	7890
Model Number	G3442B
Serial Number	CN14133181
Firmware Revision	B.02.03
Oven Type	Standard

Inlet 1	
Manufacturer	Agilent Technologies
Name	7890
Type	SSL
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	5977A
Serial Number	US1415M209
Firmware Revision	5977 6.00.21
High Vacuum System	Turbo Pump
Scouting Run Standard	OFN Std
MS EI Source 1	
Manufacturer	Agilent Technologies
Source Type	EI - Extractor
Number of filaments	2

Electronic Signature

Purpose

This signature page was created and published because the ACE sign-off action was executed, which is valid for the entire document, including attachments. The ACE sign-off is an electronic signature that requires two distinct identification components: unique username and personal password. The Agilent representative who has delivered this service understands the meaning and legal status of an electronic signature. As a trained official operator, the Agilent representative has a unique password and login to access ACE and electronically sign this document. (Other e-signatures can be applied to this document using a Document Content Management or other suitable method defined in your data access and control procedures.)

Details

Full Name of Signer: Supasak Nimsongtham
Logged On User Name: supasak.nimsongtham@agilent.com
Signature Creation Date: June 21, 2022
Reason for Signature: Executed protocol and published this original version of document

Regulatory Disclaimer

This document provides a protocol to verify and record instrument configuration and evidence of proper operation. It has been prepared from our interpretation of applicable regulations as well as industry best practices. The document is designed to provide an important component of a complete compliance package. Validation depends upon many factors and use of this protocol alone does not assure compliance. Agilent Technologies makes no promises or representations as to its sufficiency for any specific regulatory program.

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User Name: supasak.nimsongtham
Host Name: SC0115HNC
ALS-GM-7-2022 Transaction Log:

System ID: GM-7
Print Date: June 21, 2022 2:04:17 PM

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
June 21, 2022 10:25:09 AM	Audit	Session Created	Session	None
June 21, 2022 10:25:09 AM	Start	Configuration	Session	None
June 21, 2022 10:25:09 AM	Audit	Enrollment	Logging	User is Field Engineer and does not require an unlock code
June 21, 2022 10:25:26 AM	Audit	Eng-Loaded	Session	EOP details for primary technique [GC]- File path: [ProtocolPath\GC\Config\Protocol\GC\GCs\GCs.02.50.eop] EOP File Name: [GC.02.50.eop], EOP Name: [AgilentRecommended] EOP details for hyphenated technique [GC/MS]- File path: [ProtocolPath\GC/MS\Config\Protocol\GC/MS\GCs\GCs.02.50.eop] EOP File Name: [GCs.02.50.eop], EOP Name: [AgilentRecommended]
June 21, 2022 10:25:29 AM	End	Configuration	Session	None
June 21, 2022 10:25:43 AM	Start	Qualification	Session	OQ
June 21, 2022 10:25:43 AM	Start	Execution	System Inspection and Basic Safety and Operation - 7890 - Qualitative Test - No subpoints associated	None
June 21, 2022 10:25:54 AM	End	Execution	System Inspection and Basic Safety and Operation - 7890 - Qualitative Test - No subpoints associated	Run Count: 1

User Name: supasak.unisongham
Hostname: SCG115HNC
ALS-GNT-2022 Transaction Log :

User Name: supasak.unisongham
Hostname: SCG115HNC
ALS-GNT-2022 Transaction Log :

System ID: GM-7
Print Date: June 21, 2022 2:04:17 PM

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
June 21, 2022 10:26:00 AM	Start	Execution	Initial Pressure Accuracy - Front	None
			SSL - Pressure Controlled Init	- S: 25.0 psi - L: <= 1.2 psi
June 21, 2022 10:26:10 AM	End	Execution	Initial Pressure Accuracy - Front	Run Count: 1
			SSL - Pressure Controlled Init	- S: 25.0 psi - L: <= 1.2 psi
June 21, 2022 10:26:12 AM	Start	Execution	GC Oven Temperature	None
			Accuracy - 7850: - Temperature	: Oven - S: 230.0°C - L: >= -1.0
				AND <= 1.0 % setpoint in K
June 21, 2022 10:34:09 AM	Audit	Data	GC Oven Temperature	Manual Data Entry
			Accuracy - 7850: - Temperature	: Oven - S: 230.0°C - L: >= -1.0
				AND <= 1.0 % setpoint in K
June 21, 2022 10:34:10 AM	End	Execution	GC Oven Temperature	Run Count: 1
			Accuracy - 7850: - Temperature	: Oven - S: 230.0°C - L: >= -1.0
				AND <= 1.0 % setpoint in K
June 21, 2022 10:34:11 AM	Start	Execution	GC Oven Temperature	None
			Accuracy - 7850: - Temperature	: Oven - S: 100.0°C - L: >= -1.0
				AND <= 1.0 % setpoint in K
June 21, 2022 10:38:42 AM	Audit	Data	GC Oven Temperature	Manual Data Entry
			Accuracy - 7850: - Temperature	: Oven - S: 100.0°C - L: >= -1.0
				AND <= 1.0 % setpoint in K
June 21, 2022 10:38:44 AM	End	Execution	GC Oven Temperature	Run Count: 1
			Accuracy - 7850: - Temperature	: Oven - S: 100.0°C - L: >= -1.0
				AND <= 1.0 % setpoint in K
June 21, 2022 10:38:46 AM	Start	Execution	GC Oven Temperature Stability	None
			- 7850: - Temperature: Oven -	S: 100.0°C - L: <= 0.5°C

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User Name: supasak.unisongham
Hostname: SCG115HNC
ALS-GNT-2022 Transaction Log :

User Name: supasak.unisongham
Hostname: SCG115HNC
ALS-GNT-2022 Transaction Log :

System ID: GM-7
Print Date: June 21, 2022 2:04:17 PM

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
June 21, 2022 11:01:00 AM	Audit	AcctClosed	Session	None
June 21, 2022 11:01:47 AM	Audit	AcctRestarted	Session	None
June 21, 2022 11:01:48 AM	Audit	SessionReloaded	Session	None
June 21, 2022 11:01:51 AM	Start	Qualification	Session	QQ
June 21, 2022 11:01:51 AM	Start	Execution	GC Oven Temperature Stability	None
			- 7850: - Temperature: Oven -	S: 100.0°C - L: <= 0.5°C
June 21, 2022 11:03:14 AM	Audit	Data	DataManager	DataSaver was in a data verification state but the user chose to shut over.
June 21, 2022 11:04:19 AM	Audit	Data	GC Oven Temperature Stability	Manual Data Entry
			- 7850: - Temperature: Oven -	S: 100.0°C - L: <= 0.5°C
June 21, 2022 11:04:22 AM	End	Execution	GC Oven Temperature Stability	Run Count: 1
			- 7850: - Temperature: Oven -	S: 100.0°C - L: <= 0.5°C
June 21, 2022 11:04:24 AM	Start	Execution	Log Amp - 5977A SQ: - Source: EI - Extractor	None
June 21, 2022 11:04:24 AM	End	Execution	Log Amp - 5977A SQ: - Source: EI - Extractor	Run Count: 1
June 21, 2022 11:04:27 AM	Start	Execution	RFPA - 5977A SQ: - Source: EI - Extractor	None
June 21, 2022 11:04:27 AM	End	Execution	RFPA - 5977A SQ: - Source: EI - Extractor	Run Count: 1
June 21, 2022 11:07:52 AM	Start	Execution	Tune EI - 5977A SQ: - Source: EI - Extractor	None
			Qualitative - No setpoints associated	

Page 3 / 8

User Name: supasak.nisongtham Hostname: SCG115HKC ALS-GMT-2022 Transaction log :		System ID: GM-7 Print Date: June 21, 2022 2:04:17 PM	
Time	Transaction State	Activity Performed	Optional Information
June 21, 2022 11:08:05 AM End		Execution	Tune EI - 5977A.SD - Source: - Run Count: 1 EI - Extractor Filament 1 (Qualitative - No aliquots associated)
June 21, 2022 11:14:59 AM Start		Execution	Tune EI - 5977A.SD - Source: - None EI - Extractor Filament 2 (Qualitative - No aliquots associated)
June 21, 2022 11:16:48 AM End		Execution	Tune EI - 5977A.SD - Source: - Run Count: 1 EI - Extractor Filament 2 (Qualitative - No aliquots associated)
June 21, 2022 11:16:49 AM Start		Execution	Signal to Noise EI - Liquid Injection, Front SSL, SD - Source: EI - Extractor using Filament 1 - L: >= 1200
June 21, 2022 11:17:05 AM Start		Execution	Signal to Noise EI - Liquid Injection, Front SSL, SD - Source: EI - Extractor using Filament 2 - L: >= 1200
June 21, 2022 11:17:10 AM Start		Execution	Signal to Noise EI - Liquid Injection, Front SSL, SD - Source: EI - Extractor using Filament 1 - L: >= 1200
June 21, 2022 11:28:09 AM Audit		AccClosed	None
June 21, 2022 12:36:29 PM Audit		AccRestarted	None
June 21, 2022 12:36:22 PM Audit		Session/Reloaded	None
June 21, 2022 12:36:26 PM Start		Qualification	OQ
June 21, 2022 12:36:26 PM Start		Execution	Signal to Noise EI - Liquid Injection, Front SSL, SD - Source: EI - Extractor using Filament 1 - L: >= 1200

User Name: supasak.nisongtham Hostname: SCG115HKC ALS-GMT-2022 Transaction log :		System ID: GM-7 Print Date: June 21, 2022 2:04:17 PM	
Time	Transaction State	Activity Performed	Optional Information
June 21, 2022 12:37:07 PM Start		Execution	Signal to Noise EI - Liquid Injection, Front SSL, SD - Source: EI - Extractor using Filament 2 - L: >= 1200
June 21, 2022 12:37:08 PM Start		Execution	Signal to Noise EI - Liquid Injection, Front SSL, SD - Source: EI - Extractor using Filament 1 - L: >= 1200
June 21, 2022 12:38:54 PM Audit		Data	Signal to Noise EI - Liquid Injection, Front SSL, SD - Source: EI - Extractor using Filament 1 - L: >= 1200 Data File Path : H:\ALSGMT_2022\SNF1_001.D
June 21, 2022 12:39:24 PM Audit		Data	Signal to Noise EI - Liquid Injection, Front SSL, SD - Source: EI - Extractor using Filament 1 - L: >= 1200 Data File Path : H:\ALSGMT_2022\SNF1_001.D
June 21, 2022 12:40:05 PM Audit		Data	Signal to Noise EI - Liquid Injection, Front SSL, SD - Source: EI - Extractor using Filament 1 - L: >= 1200 Data File Path : H:\ALSGMT_2022\SNF1_001.D
June 21, 2022 12:42:04 PM Audit		Data	Signal to Noise EI - Liquid Injection, Front SSL, SD - Source: EI - Extractor using Filament 1 - L: >= 1200 Data File Path : H:\ALSGMT_2022\SNF1_001.D
June 21, 2022 12:42:17 PM Audit		AccClosed	None
June 21, 2022 12:33:31 PM Audit		AccRestarted	None
June 21, 2022 12:33:33 PM Audit		Session/Reloaded	None
June 21, 2022 12:33:37 PM Start		Qualification	OQ
June 21, 2022 12:33:37 PM Start		Execution	Signal to Noise EI - Liquid Injection, Front SSL, SD - Source: EI - Extractor using Filament 1 - L: >= 1200

User Name: supasak.jitnongsingham
Hostname: SCG1115HKC
ALS-GM7-2022 Transaction log :
System ID: GM-7
Print Date: June 21, 2022 2:04:17 PM

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
June 21, 2022 12:34:44 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 1 - L >= 1200	Data files Path : EVALSGM7_2022SNF1_001 .D
June 21, 2022 12:36:28 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 1 - L >= 1200	Run Count : 1
June 21, 2022 12:37:11 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 2 - L >= 1200	None
June 21, 2022 12:38:15 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 2 - L >= 1200	Data files Path : EVALSGM7_2022SNF2_001 .D
June 21, 2022 12:38:39 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 2 - L >= 1200	Data files Path : EVALSGM7_2022SNF2_001 .D
June 21, 2022 12:38:45 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 2 - L >= 1200	Data files Path : EVALSGM7_2022SNF2_001 .D
June 21, 2022 12:39:09 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 2 - L >= 1200	Data files Path : EVALSGM7_2022SNF2_001 .D
June 21, 2022 12:39:14 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 2 - L >= 1200	Data files Path : EVALSGM7_2022SNF2_001 .D

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User Name: supasak.jitnongsingham
Hostname: SCG1115HKC
ALS-GM7-2022 Transaction log :
System ID: GM-7
Print Date: June 21, 2022 2:04:17 PM

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
June 21, 2022 12:39:45 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 2 - L >= 1200	Data files Path : EVALSGM7_2022SNF2_001 .D
June 21, 2022 12:40:16 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 2 - L >= 1200	Data files Path : EVALSGM7_2022SNF2_001 .D
June 21, 2022 12:40:40 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 2 - L >= 1200	Data files Path : EVALSGM7_2022SNF2_001 .D
June 21, 2022 12:41:09 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 2 - L >= 1200	Data files Path : EVALSGM7_2022SNF2_001 .D
June 21, 2022 12:41:29 PM	End	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 2 - L >= 1200	Run Count : 1
June 21, 2022 12:42:39 PM	Audit	Test(Unloaded)	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 2 - L >= 1200	Deviation filed for Run Count : 1
June 21, 2022 12:42:39 PM	Start	Execution	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 2 - L >= 1200	None
June 21, 2022 12:42:35 PM	Audit	Data	Signal to Noise EI - Liquid Injection, Front SSL, SOI - Source: EI - Extractor using Flament 2 - L >= 1200	Data files Path : EVALSGM7_2022SNF2_001 .D

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User Name: supasak.jintongham
Host Name: SGG115HMC
ALS-GMT-2022 Transaction Log:
System ID: GM-7
Print Date: June 21, 2022 2:04:17 PM

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
June 21, 2022 12:42:46 PM	End	Execution	Signal to Nuclei EI - Liquid Injection, Front SSL, SQ - Source: EI - Extractor using Filament 2 - L1 >= 1200	Run Count: 2
June 21, 2022 12:42:50 PM	End	Qualification	Session	OO
June 21, 2022 12:42:50 PM	Start	Reporting	Session	None
June 21, 2022 12:45:17 PM	Audit	AccClosed	Session	None
June 21, 2022 1:57:47 PM	Audit	AccRetained	Session	None
June 21, 2022 1:57:50 PM	Audit	SessionReloaded	Session	None
June 21, 2022 1:57:56 PM	Start	Qualification	Session	OO
June 21, 2022 2:02:42 PM	Audit	Reporting	Session	Report Generated: Certificate

ภาคผนวก จ

สำเนาหนังสือใบอนุญาตขึ้นทะเบียน
ห้องปฏิบัติการวิเคราะห์เอกชน



ที่อก ๑๓๑๐(๑)/ ๑๐๖ ๙

๒ ๘ มกราคม ๒๕๖๕

เรื่อง ด้อยทุนขึ้นทะเบียนขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอลอส แล็บอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียนต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารเคมีของห้องปฏิบัติการวิเคราะห์เอกชน

ลงวันที่ ๓๐ กรกฎาคม ๒๕๖๓

สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผน

๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ แผน

๓. ขอบข่ายสารเคมีที่รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ แผน

ตามหนังสืออ้างถึง บริษัท เอลอส แล็บอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุ

หนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔-ส.๑๔๔

ขอพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร

ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอลอส แล็บอราทอรี กรุ๊ป (ประเทศไทย)

จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย ตามสิ่งที่ส่งมาด้วย ๑

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๖๒ ราย ตามสิ่งที่ส่งมาด้วย ๒

ค. ขอบข่ายสารเคมีที่ได้รับขึ้นทะเบียนวิเคราะห์ในน้ำเสีย จำนวน ๕๙ รายการ นำได้ขึ้น

จำนวน ๑๖๒ รายการ ยกเว้น 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 ก่อนวันสิ้นสุดอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์

เอกชน ซึ่งคำขอต่ออายุดังกล่าวจะได้รับได้ทำการโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศิระ จันทเลิศ)

อธิบดีกรมโรงงานอุตสาหกรรม

ผู้อำนวยการสำนักงานส่งเสริมการค้าในต่างประเทศ

ผู้ตรวจการแผ่นดิน

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๖๐๒ ๔๔๖๖ ๐ ๒๖๐๒ ๔๐๐๒

โทรสาร ๐ ๒๓๕๕ ๓๒๐๘ ๐ ๒๓๕๕ ๓๔๔๕

เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอลอส แล็บอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

ที่อก ๑๓๑๐(๑)/

ลงวันที่ ๒ ๘ มกราคม ๒๕๖๕

เลขทะเบียน ๖-๒๐๔

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย

๑) นางสาวยุพพร จันทเลิศ

๒) นางสาวชัญญ์ โจนารกุล ณ นคร

๓) นายศรายุทธ จิตราชนันท์

๔) นางสาวกนกกร เอมก

๕) นายสุริยา สอนแก้ว

๖) นายวิชาญ พงษ์รัตน์

ทะเบียนเลขที่ ๖-๒๐๔-ค-๔๗๐๐

ทะเบียนเลขที่ ๖-๒๐๔-ค-๔๗๐๑

ทะเบียนเลขที่ ๖-๒๐๔-ค-๔๗๐๒

ทะเบียนเลขที่ ๖-๒๐๔-ค-๕๑๑๑

ทะเบียนเลขที่ ๖-๒๐๔-ค-๕๑๑๒

ทะเบียนเลขที่ ๖-๒๐๔-ค-๕๑๑๓

๐๒๒

(นายศิระ จันทเลิศ)

อธิบดีกรมโรงงานอุตสาหกรรม

ผู้อำนวยการสำนักงานส่งเสริมการค้าในต่างประเทศ

ผู้ตรวจการแผ่นดิน

เอกสารแนบท้ายหนังสือรับต่ออายุทะเบียนหนังสือปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลเบอร์ทอรี กรุ๊ป (ประเทศไทย) จำกัด

ที่ อก ๐๓๑๐(๑) / ๑๐๖๙

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๖๒ ราย

เลขทะเบียน ๖-๒๐๔

๒๕๖๕

- ๑) นางสาวจินดา ไชยธรรม เลขทะเบียน ๖-๒๐๔-๖-๕๗๐๕
- ๒) นางสาวสุวิทย์ น้อยสัณย เลขทะเบียน ๖-๒๐๔-๖-๕๗๐๖
- ๓) นางสาวณัฐกัญญา อัมสม เลขทะเบียน ๖-๒๐๔-๖-๕๗๐๗
- ๔) นางสาวปริมาพร สายแสง เลขทะเบียน ๖-๒๐๔-๖-๕๗๐๘
- ๕) นางสาวนันท์ดี สมบูรณ์ เลขทะเบียน ๖-๒๐๔-๖-๕๗๐๙
- ๖) นางสาวศรัณยา เอลินดำรง เลขทะเบียน ๖-๒๐๔-๖-๕๗๑๐
- ๗) นางสาวสุวิทย์ มงคลศิริวุฒิ เลขทะเบียน ๖-๒๐๔-๖-๕๗๑๑
- ๘) นางสาวศิริลักษณ์ หังแพง เลขทะเบียน ๖-๒๐๔-๖-๕๗๑๒
- ๙) นายพนพงค์ จันทพันธ์ เลขทะเบียน ๖-๒๐๔-๖-๕๗๑๓
- ๑๐) นายบรรพตกร โภมาลัย เลขทะเบียน ๖-๒๐๔-๖-๕๗๑๔
- ๑๑) นายธวัช จักรยา เลขทะเบียน ๖-๒๐๔-๖-๕๗๑๕
- ๑๒) นางสาวกศรินทร์ แก้วมัน เลขทะเบียน ๖-๒๐๔-๖-๕๗๑๖
- ๑๓) นางสาวสุมิลา ชัยเรืองวุฒิ เลขทะเบียน ๖-๒๐๔-๖-๕๗๑๗
- ๑๔) นางสาวสุชาดา ธรรมการ เลขทะเบียน ๖-๒๐๔-๖-๕๗๑๘
- ๑๕) นางสาวเปมิกา ชัยเดชกุล เลขทะเบียน ๖-๒๐๔-๖-๕๗๑๙
- ๑๖) นางสาวศศิธร หนูสวัสดิ์ เลขทะเบียน ๖-๒๐๔-๖-๕๗๒๐
- ๑๗) นางสาวเสาวลักษณ์ ปุณากาพร เลขทะเบียน ๖-๒๐๔-๖-๕๗๒๑
- ๑๘) นายอภิสิทธิ์ สิงหา เลขทะเบียน ๖-๒๐๔-๖-๕๗๒๒
- ๑๙) นายศักดิ์สิทธิ์ ไชยสิทธิ์ เลขทะเบียน ๖-๒๐๔-๖-๕๗๒๓
- ๒๐) ว่าที่ร้อยตรีหญิง พรรณีภา ขำเจริญ เลขทะเบียน ๖-๒๐๔-๖-๕๗๒๔
- ๒๑) นางจิตตา คำบุญแก้ว เลขทะเบียน ๖-๒๐๔-๖-๕๗๒๕
- ๒๒) นางสาวอรรณพ รักษ์ เลขทะเบียน ๖-๒๐๔-๖-๕๗๒๖
- ๒๓) นางสาวนพรัตน์ แยมกรานต์ เลขทะเบียน ๖-๒๐๔-๖-๕๗๒๗
- ๒๔) นายอุบลเดช วาไรนทร์ เลขทะเบียน ๖-๒๐๔-๖-๕๗๒๘
- ๒๕) นางสาวดาญรัตน์ ร้องคำ เลขทะเบียน ๖-๒๐๔-๖-๕๗๒๙
- ๒๖) นายนคร สุขเจริญ เลขทะเบียน ๖-๒๐๔-๖-๕๗๓๐
- ๒๗) นายบัญชา นามเขต เลขทะเบียน ๖-๒๐๔-๖-๕๗๓๑
- ๒๘) นายพรมณ์ ศรีรัตนตร เลขทะเบียน ๖-๒๐๔-๖-๕๗๓๒
- ๒๙) นายจิตต์ อุเลิม เลขทะเบียน ๖-๒๐๔-๖-๕๗๓๓
- ๓๐) ว่าที่ร้อยตรี เอลิเบกกี อมรศรีเสริม เลขทะเบียน ๖-๒๐๔-๖-๕๗๓๔
- ๓๑) นางสาววิภา สร้างนา เลขทะเบียน ๖-๒๐๔-๖-๕๗๓๕
- ๓๒) นายอนุพงศ์ รัตนศรีประเสริฐ เลขทะเบียน ๖-๒๐๔-๖-๕๗๓๖
- ๓๓) นางสาวจุฑาภรณ์ โอนันต์เษ เลขทะเบียน ๖-๒๐๔-๖-๕๗๓๗
- ๓๔) นางสาวจวรรณ พิมพ์ศรีภูมิ เลขทะเบียน ๖-๒๐๔-๖-๕๗๓๘

(นายศิระ จันทเลิศ)

๓๕) นางสาวปรังทิพย์...

ผู้มีอำนาจลงนามในบัญชีรายชื่อ
ผู้ดำเนินการลงนามในบัญชีรายชื่อ
ผู้ดำเนินการลงนามในบัญชีรายชื่อ

- ๒ -

๓๕) นางสาวปรังทิพย์ จันทเลิศ

๓๖) นางสาวเดือนใจ ทางกลาง

๓๗) นางสาวจิราพร ศิริเวช

๓๘) นายวรากร สุทธิรักษ์

๓๙) นายพนม วิริยะสิทธิ์

๔๐) นายอนันต์ เจริญ

๔๑) นายณิศร จันทพร

๔๒) นายอรรคพล นิยมวิทย์

๔๓) นายภูวรินทร์ พรหมเสนา

๔๔) นายณเดชน์ โกคำพิพัฒน์

๔๕) นายชวฤทธิ์ วงษ์จันทร์

๔๖) นายอาทิตย์ ศรีเสน

๔๗) นายเจตติมาพร คงศักดิ์ไทย

๔๘) นายจรัส บุญยั้ง

๔๙) นายณณานิธิ เอนก

๕๐) นายอภิวัฒน์ พุ่มหนู

๕๑) นางสาวสุภาวัญญา มาก

๕๒) นางสาวศศิธร ขวาลสมบุญ

๕๓) นางสาววิไลมา บุญเพ็ง

๕๔) นางสาวกนกกร เข้มเพชร

๕๕) นางสาวพัชรียา หงษ์สมดี

๕๖) นางสาวกนิดา สุวงศ์ตระกูล

๕๗) นางสาวกนกนุช นามวัฒน์

๕๘) นางสาวอุไรรัตน์ หังสร้างเป็น

๕๙) นายธีรวัฒน์ ปวงสุข

๖๐) นายอภิสิทธิ์ ยะโส

๖๑) นายประพนธ์ วรณชัย

๖๒) นายยุทธ พวงพิชัย

๖๓) นางสาวกนกวรรณ จันทบาล

๖๔) นางสาวกมลกร หล้าบุญ

๖๕) นายสิทธิโชค ธงเงิน

๖๖) นางสาววรรณใจ ใจบุญ

๖๗) นางสาวพรณิศา หุ่มคง

๖๘) นางสาวกรรณีย์ ยิ่งดี

๖๙) นายวาทิต ศรีวิริยะ

๗๐) นายสุวิชา ทองอ่อน

๗๑) นายวิญญู บุญตะเนี่ย

๗๒) นายณัฐวัฒน์...

๗๓) นายณัฐวัฒน์...

๗๔) นายณัฐวัฒน์...

๗๕) นายณัฐวัฒน์...

ผู้มีอำนาจลงนามในบัญชีรายชื่อ
ผู้ดำเนินการลงนามในบัญชีรายชื่อ
ผู้ดำเนินการลงนามในบัญชีรายชื่อ

๗๖) นายสมบุญ...

- ๑๕๖) นางสาวสุดารัตน์ สุนทรสนาน ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๓๕
- ๑๕๗) นางสาวสุดารัตน์ นนท์ประสาท ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๓๖
- ๑๕๘) นางสาวรัชกร เนียมกลาง ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๓๗
- ๑๕๙) นางสาวกัญญารัตน์ ศรีนิสทา ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๓๘
- ๑๖๐) นางสาวอัญชลี คำจันทร์ ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๓๙
- ๑๖๑) นายบุญฤทธิ์ เอี่ยมเทศ ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๔๐
- ๑๖๒) นายศิริวัฒน์ พานิชย์ ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๔๑
- ๑๖๓) นางสาวสุภาวดี ปิ่นมยุรา ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๔๒
- ๑๖๔) นางสาวพาสี คุณมานะ ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๔๓
- ๑๖๕) นางสาวจิราเจต พองดา ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๔๔
- ๑๖๖) นางสาวกนกภรณ์ อุระ ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๔๕
- ๑๖๗) นางสาวอารยา มีชัย ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๔๖
- ๑๖๘) นางสาวจิตสุภา ประเพ็ญสุข ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๔๗
- ๑๖๙) นางสาวอริสา วรชัยเดิธรรม ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๔๘
- ๑๖๐) นางสาววิชุดา นาคผจญ ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๔๙
- ๑๖๑) นางสาวปิ่นดา ยอดอินทร์ ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๕๐
- ๑๖๒) นางสาวนันทิยา จันทะสุน ทะเบียนเลขที่ ๖-๒๐๔-๖-๕๒๕๑



(นายอิสระ จันทะสุน)

นักวิทยาศาสตร์ด้านสุขภาพ วิทยาลัยการแพทย์
ผู้อำนวยการศูนย์และห้องปฏิบัติการ
ปฏิบัติการทางพันธุกรรมโรงพยาบาล

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แล็บราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๒๐๔
ที่ อก ๑๓๑๐(๑) ๑๐๖๕ ลงวันที่ ๒๕ มกราคม ๒๕๖๕

ขอบข่ายสารเคมีที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๖๑ รายการ

บัญชี จำนวน 59 รายการ

ลำดับที่	สารเคมี	วิธีการวิเคราะห์
1	Aldicarb	High-Performance Liquid Chromatographic Method ^(a)
2	Aldicarb Sulfone	High-Performance Liquid Chromatographic Method ^(a)
3	Aldicarb Sulfoxide	High-Performance Liquid Chromatographic Method ^(a)
4	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ^(a)
5	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
6	Barium	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
7	α-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ^(a)
8	β-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ^(a)
9	γ-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ^(a)
10	γ-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ^(a)
11	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method ^(a) 2) 5-Day BOD Test, Membrane Electrode Method ^(a)
12	Carbaryl	High-Performance Liquid Chromatographic Method ^(a)
13	Carbofuran	High-Performance Liquid Chromatographic Method ^(a)
14	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
15	Chemical Oxygen Demand	1) Closed Reflux, Colorimetric Method ^(a) 2) Closed Reflux, Titrimetric Method ^(a)
16	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic Method ^(a)
17	Chromium	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(a)
18	Color	ADMI Weighted-Ordinate Spectrophotometric Method

ลำดับที่	สารเคมี	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 ⁽⁴⁾
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⁾

วิธีใหม่

44 Methomyl...

(นางรักกัญจน์ อัครสุภาวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบผลิตภัณฑ์

มาตรฐานผลิตภัณฑ์เกษตร

ลำดับที่	สารเคมี	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	Phendls	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⁾

นับได้รวม จำนวน 126 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾

วิธีใหม่

3 Aldrin...

(นางรักกัญจน์ อัครสุภาวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบผลิตภัณฑ์

มาตรฐานผลิตภัณฑ์เกษตร

ลำดับที่	สารเคมี	วิธีการหา
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
8	Barium	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
9	Benzo(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
13	Benzoic Acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
15	Benzo[ghi]perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)

18 Bis(2-ethylhexyl)phthalate...

Signature
(นางริษาญจน์ ชัยรสสุทิน)
ผู้อำนวยการศูนย์มาตรฐานวิธีกริการวิเคราะห์ทดสอบเคมี
กรมมาตรฐานวิธีกริการวิเคราะห์ทดสอบเคมี

ลำดับที่	สารเคมี	วิธีการหา
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
22	Butyl Benzyl Phthalate	Mass Spectrometric Headspace, Gas Chromatographic/ Mass Spectrometric Method ^(a)
23	Cadmium	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a) 1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
27	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)

34 Chromium (III)...

Signature
(นางริษาญจน์ ชัยรสสุทิน)
ผู้อำนวยการศูนย์มาตรฐานวิธีกริการวิเคราะห์ทดสอบเคมี
กรมมาตรฐานวิธีกริการวิเคราะห์ทดสอบเคมี

ลำดับที่	สารเคมี	วิธีวิเคราะห์
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ^(a)
35	Chromium (VI)	Colorimetric Method ^(a)
36	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
37	Cyanide	Distillation, Colorimetric Method ^(a)
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
39	DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
40	DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
41	DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
42	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
43	Di-n-Butyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
47	3,3-Dichlorobenzidine	Mass Spectrometric Method ^(a)
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)

51 cis-1,2-Dichloroethylene...

สปม
(นางริกาญจน์ จัตุสกลกิจ)
ผู้อำนวยการศูนย์วิจัยการวิเคราะห์พิษวิทยา
กรมวิทยาศาสตร์สาธารณสุข

ลำดับที่	สารเคมี	วิธีวิเคราะห์
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
57	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
58	Diethyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
63	Di-n-Octyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
64	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
65	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)

68 Fluorene...

สปม
(นางริกาญจน์ จัตุสกลกิจ)
ผู้อำนวยการศูนย์วิจัยการวิเคราะห์พิษวิทยา
กรมวิทยาศาสตร์สาธารณสุข

ลำดับที่	สารเคมี	วิธีวิเคราะห์
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
69	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
70	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
74	α-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
75	β-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
76	γ-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
81	Lead	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
83	Mercury	1) Cold Vapor Atomic Absorption Spectrometric Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)

84 Methanol...

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ลำดับที่	สารเคมี	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a) 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^(a)
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
95	N-Nitrosodi-n-Propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
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 ^(a)

97 Pentachlorophenol...

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ลำดับที่	สารเคมี	วิธีการวิเคราะห์
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
98	pH	Electrometric Method ^(a)
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
100	Phenol	1) Distillation, Direct Photometric Method ^(a) 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
102	Selenium	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
103	Silver	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
104	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
105	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
106	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
107	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
108	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
109	TPH (C ₅ -C ₆)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽³⁾⁽⁴⁾
110	TPH (C ₈ -C ₁₀)	Solvent Extraction, Gas Chromatographic Method ⁽³⁾⁽²¹⁾
111	TPH (C ₁₀ -C ₃₅)	Solvent Extraction, Gas Chromatographic Method ⁽³⁾⁽²¹⁾
112	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
113	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)

114 1,1,2-Trichloroethane...

Signature
(นางรักกัญญา อัครสกุลใจ)
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และระบบข้อมูลห้องปฏิบัติการ

ลำดับที่	สารเคมี	วิธีการวิเคราะห์
114	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
115	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
118	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
119	Vanadium	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
120	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
121	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
122	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
123	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
124	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
125	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
126	Zinc	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)

เอกสารนี้ (ปล้องระบาย) จำนวน 16 ผนวก

ลำดับที่	สารเคมี	วิธีการวิเคราะห์
1	Antimony	Isokinetic, Digestion, Inductively Coupled Plasma Method ^(a)
2	Arsenic	Isokinetic, Digestion, Inductively Coupled Plasma Method ^(a)

Signature
3 Carbon Monoxide...

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และระบบข้อมูลห้องปฏิบัติการ

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] Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
5	Copper	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory or Analysis by Department of Industrial Works Registered Laboratory (Dioxins/Furans Analysis Approved) ^[5]
6	Dioxins	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5] Absorption Sampling, Iodometric Method ^[5] Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
7	Hydrogen Chloride	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[5]
8	Hydrogen Sulfide	2) Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
9	Lead	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[5]
10	Mercury	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	Absorption Sampling, Gas Chromatographic Method ^[5]

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กรมส่งเสริมการค้าระหว่างประเทศ

สัญญา

สิ่งปลูกสร้างหรือวัสดุที่ไม่ใช่แล้ว จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,23] 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 ^[1,6,19] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,19] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,19] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,19] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,19] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,19] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,19] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,19] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]

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6 Cadmium...

ลำดับที่	สารเคมี	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 ^(1.9.25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10.22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(2.23)
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 ^(7.15.17) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7.16.17)
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^(1.6.17) 2) Alkaline Digestion, Colorimetric Method ^(3.17)

3mg/L

(นางริกาญจน์ อัครสกุลกิจ)

ผู้อำนวยการศูนย์ปฏิบัติการวิเคราะห์ทดสอบค่า

กรมส่งเสริมการค้าระหว่างประเทศ

11 Cobalt...

ลำดับที่	สารเคมี	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 ^(2.23)
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 ^(2.23)
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 ^(2.23)
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.25)

3mg/L

(นางริกาญจน์ อัครสกุลกิจ)

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กรมส่งเสริมการค้าระหว่างประเทศ

2) Soxhlet...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic Method ^(10,21) 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) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,21) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,21) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,21) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
20	Lead	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 ^(10,21) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(1,6,18)

วิธีวิเคราะห์ 2) Waste Extraction...

(นางริกาญจน์ ฉัตรสุภาวดี)

ผู้อำนวยการศูนย์วิจัยวิทยาศาสตร์พิษภัย

ลำดับที่	สารเคมี	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 ^(1,6) 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ^(1,9) 6) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽²⁰⁾ 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,21) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,21) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
25	Molybdenum	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) 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)

วิธีวิเคราะห์ 27 Polychlorinated...

(นางริกาญจน์ ฉัตรสุภาวดี)

ผู้อำนวยการศูนย์วิจัยวิทยาศาสตร์พิษภัย

ลำดับที่	สารเคมี	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',4,5,5-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 ⁽²³⁾⁽³¹⁾

28 Pentachlorophenol...

(นางสาวกัญญา นิตยกุลวิไล)

ผู้อำนวยการศูนย์มาตรฐานวิชาการกระทรวงมหาดไทย

ลำดับที่	สารเคมี	วิธีวิเคราะห์
28	Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾⁽⁹⁾⁽²³⁾ 2) Soxhlet Extraction, Gas Chromatographic Method ⁽¹⁰⁾⁽²¹⁾ 3) Automated Soxhlet Extraction, Gas Chromatographic Method ⁽²³⁾⁽³¹⁾ Electrometric Method ⁽²⁹⁾⁽³⁰⁾ 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⁾
29	pH	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁽¹⁾⁽⁶⁾⁽¹⁵⁾
30	Selenium	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⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁵⁾ 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁷⁾⁽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⁾⁽²³⁾ 2) Soxhlet Extraction, Gas Chromatographic Method ⁽¹⁰⁾⁽²¹⁾ 3) Automated Soxhlet Extraction, Gas Chromatographic Method ⁽²³⁾⁽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⁾
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⁾

4) Digestion...

(นางสาวกัญญา นิตยกุลวิไล)

ผู้อำนวยการศูนย์มาตรฐานวิชาการกระทรวงมหาดไทย

ลำดับที่	สารเคมี	วิธีวิเคราะห์
35	Zinc	4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,14) 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(14,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(14,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,14)

ดิน จำนวน 125 รายการ

ลำดับที่	สารเคมี	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)

9 Benz(a)anthracene...

วิธีแปล (นางวิภาญญ์ นิตกรกุลวิไล)

ผู้ควบคุมการแปลงานแปลเอกสาร

ลำดับที่	สารเคมี	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	Benz(b)fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
12	Benz(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	Benzol(a)pyrene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
15	Benzog(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)

26 Carbon tetrachloride...

วิธีแปล (นางวิภาญญ์ นิตกรกุลวิไล)

ผู้ควบคุมการแปลงานแปลเอกสาร

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 ^(7,14)
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)

40 DDE...

ผู้ชำนาญการชำนาญการวิชาการที่สอบเทียบ
(นางวิภาดา ธีระกุลสวัสดิ์)
57 Dieldrin...

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)

57 Dieldrin...

ผู้ชำนาญการชำนาญการวิชาการที่สอบเทียบ
(นางวิภาดา ธีระกุลสวัสดิ์)
57 Dieldrin...

ลำดับที่	สารเคมี	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	Automated Soxhlet Extraction, Gas Chromatographic/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)

71 Hexachlorobenzene...

วิธีวิเคราะห์

(นารักญานันต์ อัครกุลสุโต)

ผู้ชำนาญการพิเศษฝ่ายวิเคราะห์ทางเคมี

ลำดับที่	สารเคมี	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⁾

วิธีวิเคราะห์

2) Thermal...

(นารักญานันต์ อัครกุลสุโต)

ผู้ชำนาญการพิเศษฝ่ายวิเคราะห์ทางเคมี

กรมวิทยาศาสตร์สิ่งแวดล้อม

ลำดับที่	สารเคมี	วิธีการหา
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 ^(22,24) 1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22)
85	Methoxychlor	2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
86	Methyl Bromide	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
87	Methylene Chloride	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
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	Automated Soxhlet Extraction, 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 ^(23,27)

วิทย์กุล

(นางวิทย์กุล วิทย์กุลวิไล)

- Aroclor 1242...

ผู้ชำนาญการชำนาญการปฏิบัติการวิเคราะห์ทดสอบ

ลำดับที่	สารเคมี	วิธีการหา
97	- 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 - 2,3,3',4,6'-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6'-Hexachlorobiphenyl Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5'-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5,6'-Heptachlorobiphenyl - 2,2',3,4',5,5',6'-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6'-Nonachlorobiphenyl Pentachlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31) 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)

วิทย์กุล

(นางวิทย์กุล วิทย์กุลวิไล)

101 Selenium...

ผู้ชำนาญการชำนาญการปฏิบัติการวิเคราะห์ทดสอบ

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 ^(23,31)
108	TPH (C ₅ -C ₉)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
109	TPH (C ₁₀ -C ₁₆)	1) Solvent Extraction, Gas Chromatographic Method ^(14,24) 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^(21,31)
110	TPH (C ₁₆ - C ₃₃)	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)

116 2,4,6-Trichlorophenol...

(นางริกาญจน์ อัครสุภาวดี)
ผู้อำนวยการศูนย์มาตรฐานวิธีวิเคราะห์ของมลพิษ

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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- กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549. เรื่อง กำหนดค่าปริมาณเคมี
ภัณฑ์ที่เลือกเป็นอากาศที่ระบายออกจากรถยนต์น้ำร้อนที่ใช้แก๊สเป็นเชื้อเพลิง.
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ที่ อก ๐๓๐๓(๓)/ ๖๔ ๗ ๐

กรมโรงงานอุตสาหกรรม

ถนนพระรามที่ ๖ แขวงทุ่งพญาไท

เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒ ๘ มิถุนายน

๒๕๖๔

เรื่อง ขั้วทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียนตัวอย่าง/เปลี่ยนแปลงบุคลากร และชนิดสารเคมีของห้องปฏิบัติการวิเคราะห์เอกชน

ลงวันที่ ๒๔ เมษายน ๒๕๖๔

สิ่งที่ส่งมาด้วย เอกสารแบบขั้วยื่นขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๒ แผ่น

ตามที่ส่งมาถึงยังถึง บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอขึ้นทะเบียน

ห้องปฏิบัติการวิเคราะห์เอกชน พร้อมรายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ เจ้าหน้าที่ประจำ

ห้องปฏิบัติการวิเคราะห์ และรายการสารเคมีที่จะทำการวิเคราะห์ ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป

(ประเทศไทย) จำกัด ขั้วทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน มีผลทะเบียน ๖-๓๒๓-๓-๔๕๕๓

๖๑๖/๑๐ หมู่ที่ ๕ ตำบลเนินใหญ่ อำเภอบางบาล จังหวัดพระนครศรีอยุธยา โดยห้องปฏิบัติการดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

๑) นายเดช ข้างขนิ

๒) นายวิลาวัณย์ บริรักษ์

๓) นายสุพจน์ สานะดี

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

๑) นางสาวณกุล บรรจงกิจ

๒) นางพจนา สีตา

๓) นางสาวอนิศา กุลสุริวงศ์

๔) นายทิยา ทองแดง

๕) นางชลธิชา สุขเกษ

๖) ว่าที่ ร.ต.รุ่งชัย ม่วงมา

๗) นายรวิวัฒน์ หับพา

๘) นายศักดิ์รินทร์ จรัสถาย

๙) นายสุรศักดิ์ สาธิบ

๑๐) นางสาวพชรกุล ภวภูตานนท์

๑๑) นายสฤพร ถาแก้ว

๑๒) นายสุทธิดีรังค์ โขภิตินันท์

๑๓) นายวิลาวัณย์...

- ๑๓) นายวัลลภ หัปไชยเนาว์
๑๔) นางสาววาณิดา หะริยบุตรกุล
๑๕) นางสาวอนิศา กุลสุริวงศ์
๑๖) นายอนันต์ วิงศ์ไชย
๑๗) นายชัยสุรณ เลิศนันทกุลชัย
๑๘) นายสัจจา เพ็ชรแสวง
๑๙) นายกันตภณ มณีสินพันธ์
๒๐) นางสาวจันทิพย์ โกเมฆนะ
๒๑) นายธวัชพร อธิจินดา
๒๒) นายศุภณัฐ หิรัญพันธ์
๒๓) นายสุชัย วงศ์สุริยชัย
๒๔) นายปฐมพงศ์ กรสวัสดิ์
๒๕) นายโสว ดันโพธิ์
๒๖) นางสาวกิตติยา ลัญญากรียากรณ
๒๗) นางสาวจันทพร ศรีบุญเรือง
๒๘) นางสาวสุรินทร์ สิงเภา
๒๙) นางสาวจิตติรัตน์ ศิริมงคลโร
๓๐) นายพิพัฒน์ นิกิต์เศรษฐ์
๓๑) นายศิริพงษ์ เรืองสม
๓๒) นายปรานศ สัตยาคุณ
๓๓) นายอนุภา ธรรมะโร
๓๔) นางสาวสุกกรณ์ ไสจินทร์
๓๕) นายพชรกร อิมรเสนา
๓๖) นายทิวากร เชื้อมาก
๓๗) นายอนุรักษ ทองขจรศักดิ์
๓๘) นายอภิชาติ วิลาช
๓๙) นายจักรัษฎา ศรีรักษา
๔๐) นายประสาธมิตร เชื้อนเพชร
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๔๓) นายสิทธิชัย แก้วเกตุ
๔๔) นายทินกร กุลชาติ

ค. ขอบข่ายสารเคมีที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๑๔ รายการ
อากาศเสีย (ปล่อยระบาย) จำนวน ๗ รายการ และน้ำใต้ดิน จำนวน ๓ รายการ รวมทั้งสิ้นจำนวน ๒๔ รายการ
ตามสิ่งที่ส่งมาด้วย

Sulfuric Acid...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
6	Sulfuric Acid	Isokinetic Sampling, Barium – Thorin Titrimetric Method ⁽⁶⁾
7	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ⁽⁷⁾

น้ำดื่ม จำนวน 3 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method ⁽²⁾
2	pH	Electrometric Method ⁽⁸⁾
3	Phenols	Distillation, Direct Photometric Method ⁽³⁾

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(นางสาววิชุดา ลิ้มฤทธิผล)

ผู้อำนวยการ

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บริษัท เอแอลเอส แลборาทอรี กรุ๊ป (ประเทศไทย) จำกัด

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