

ภาคผนวก ค

ใบรับรองผลการวิเคราะห์



Analysis / Test Report



TESTING

No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108330

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2421107-1

Page 1 of 1

Sample Description	Air Quality			
Location	วัดหนองแฟบ (GPS 47P 0729819, 1403299)			
Date Analysis Commenced	Sep 15, 2022			
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag			
Sample Number	Sampled Date	Total Suspended Particulate (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
22108330-1	Sep 05 - Sep 06, 2022	0.024	756	30
22108330-2	Sep 06 - Sep 07, 2022	0.018	756	29
22108330-3	Sep 07 - Sep 08, 2022	0.021	756	29
22108330-4	Sep 08 - Sep 09, 2022	0.027	756	28
22108330-5	Sep 09 - Sep 10, 2022	0.023	756	30
22108330-6	Sep 10 - Sep 11, 2022	0.034	756	30
22108330-7	Sep 11 - Sep 12, 2022	0.030	756	30
Guideline		0.33	-	-

Reference Method

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

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

Sampled By : Satcha Phetsawaeng

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



TESTING

No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108330

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2421107-2

Page 1 of 1

Sample Description	Air Quality			
Location	วัดหนองแฟบ (GPS 47P 0730826, 1407301)			
Date Analysis Commenced	Sep 15, 2022			
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag			
Sample Number	Sampled Date	Total Suspended Particulate (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
22108330-8	Sep 05 - Sep 06, 2022	0.026	756	30
22108330-9	Sep 06 - Sep 07, 2022	0.023	756	29
22108330-10	Sep 07 - Sep 08, 2022	0.018	756	29
22108330-11	Sep 08 - Sep 09, 2022	0.045	756	28
22108330-12	Sep 09 - Sep 10, 2022	0.046	756	30
22108330-13	Sep 10 - Sep 11, 2022	0.037	756	30
22108330-14	Sep 11 - Sep 12, 2022	0.045	756	30
Guideline		0.33	-	-

Reference Method

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

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

Sampled By : Satcha Phetsawaeng

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 : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108324

Date Received : Sep 14, 2022
Date Reported : Sep 20, 2022
Report Number: 2439589-1

Page 1 of 1

Sample Description	Air Quality						
Location	วัดหนองพิน (GPS 47P 0729819, 1403299)						
Parameter	Nitrogen dioxide (ppm)						
Measurement Date	Sep 05, 2022 - Sep 12, 2022						
Measurement by	Satcha Phetsawaeng						
Time	22108324-1 Sep 05, 2022	22108324-2 Sep 06, 2022	22108324-3 Sep 07, 2022	22108324-4 Sep 08, 2022	22108324-5 Sep 09, 2022	22108324-6 Sep 10, 2022	22108324-7 Sep 11, 2022
10:00 AM - 11:00 AM	0.004	0.004	0.004	0.004	0.004	0.001	0.003
11:00 AM - 12:00 PM	0.003	0.004	0.002	0.002	0.002	0.001	0.001
12:00 PM - 01:00 PM	0.001	0.002	0.002	0.002	0.002	0.001	0.001
01:00 PM - 02:00 PM	0.002	0.002	0.002	0.002	0.002	0.001	<0.001
02:00 PM - 03:00 PM	0.002	0.002	0.002	0.002	0.002	0.001	0.001
03:00 PM - 04:00 PM	0.002	0.002	0.002	0.002	0.002	0.001	<0.001
04:00 PM - 05:00 PM	0.005	0.002	0.002	0.003	<0.001	0.001	<0.001
05:00 PM - 06:00 PM	0.008	0.003	0.003	0.006	0.002	0.001	<0.001
06:00 PM - 07:00 PM	0.007	0.006	0.004	0.002	0.002	<0.001	0.001
07:00 PM - 08:00 PM	0.007	0.004	0.004	0.004	0.002	<0.001	0.001
08:00 PM - 09:00 PM	0.007	0.002	0.004	0.006	0.002	<0.001	<0.001
09:00 PM - 10:00 PM	0.006	0.002	0.003	0.004	0.001	0.001	0.001
10:00 PM - 11:00 PM	0.005	0.001	0.003	0.002	0.001	0.001	0.001
11:00 PM - 12:00 AM	0.002	0.001	0.002	0.001	0.001	0.001	0.001
12:00 AM - 01:00 AM	0.002	0.001	0.002	0.001	<0.001	0.001	0.002
01:00 AM - 02:00 AM	0.004	0.001	0.001	0.001	<0.001	0.001	0.001
02:00 AM - 03:00 AM	0.005	0.001	<0.001	0.001	<0.001	0.001	<0.001
03:00 AM - 04:00 AM	0.007	0.001	0.001	0.001	<0.001	0.002	<0.001
04:00 AM - 05:00 AM	0.007	0.001	0.001	0.002	<0.001	0.001	<0.001
05:00 AM - 06:00 AM	0.007	0.001	0.001	0.002	<0.001	0.002	<0.001
06:00 AM - 07:00 AM	0.007	<0.001	0.002	0.001	0.002	<0.001	<0.001
07:00 AM - 08:00 AM	0.005	0.001	0.002	0.002	0.001	0.002	<0.001
08:00 AM - 09:00 AM	0.004	0.003	0.003	0.006	0.002	0.004	0.002
09:00 AM - 10:00 AM	0.002	0.006	0.004	0.006	0.002	0.004	0.002
Average	0.005	0.002	0.002	0.003	0.001	0.001	0.001
1hr - Maximum	0.008	0.006	0.004	0.006	0.004	0.004	0.003
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

Sararat Mongkonjirawut
Supervisor

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108324

Date Received : Sep 14, 2022
Date Reported : Sep 20, 2022
Report Number: 2439590-1

Page 1 of 1

Sample Description	Air Quality						
Location	วัดหนองพิน (GPS 47P 0730826, 1407301)						
Parameter	Nitrogen dioxide (ppm)						
Measurement Date	Sep 05, 2022 - Sep 12, 2022						
Measurement by	Satcha Phetsawaeng						
Time	22108324-8 Sep 05, 2022	22108324-9 Sep 06, 2022	22108324-10 Sep 07, 2022	22108324-11 Sep 08, 2022	22108324-12 Sep 09, 2022	22108324-13 Sep 10, 2022	22108324-14 Sep 11, 2022
11:00 AM - 12:00 PM	0.007	0.004	0.002	0.003	0.003	0.004	0.003
12:00 PM - 01:00 PM	0.002	0.003	0.002	0.002	0.002	0.003	0.006
01:00 PM - 02:00 PM	0.009	0.002	0.002	0.002	0.002	0.003	0.006
02:00 PM - 03:00 PM	0.003	0.003	0.003	0.002	<0.001	0.004	0.003
03:00 PM - 04:00 PM	0.002	0.006	0.004	0.003	0.001	0.004	0.003
04:00 PM - 05:00 PM	0.002	0.007	0.003	0.005	0.001	0.004	0.002
05:00 PM - 06:00 PM	0.003	0.007	0.003	0.005	0.002	0.005	0.002
06:00 PM - 07:00 PM	0.003	0.010	0.004	0.005	0.004	0.007	0.003
07:00 PM - 08:00 PM	0.003	0.009	0.009	0.010	0.004	0.006	0.007
08:00 PM - 09:00 PM	0.012	0.008	0.009	0.012	0.012	0.008	0.012
09:00 PM - 10:00 PM	0.014	0.007	0.011	0.011	0.011	0.011	0.009
10:00 PM - 11:00 PM	0.003	0.004	0.011	0.009	0.012	0.010	0.009
11:00 PM - 12:00 AM	0.004	0.007	0.007	0.004	0.007	0.009	0.011
12:00 AM - 01:00 AM	0.008	0.007	0.002	0.007	0.004	0.006	0.008
01:00 AM - 02:00 AM	0.010	0.005	0.001	0.008	0.003	0.006	0.009
02:00 AM - 03:00 AM	0.013	0.003	0.003	0.007	0.005	0.010	0.007
03:00 AM - 04:00 AM	0.011	0.003	0.001	0.009	0.005	0.010	0.002
04:00 AM - 05:00 AM	0.009	0.002	0.001	0.006	0.004	0.009	0.001
05:00 AM - 06:00 AM	0.009	0.002	0.002	0.006	0.004	0.008	0.001
06:00 AM - 07:00 AM	0.009	0.004	0.002	0.005	0.005	0.008	0.001
07:00 AM - 08:00 AM	0.008	0.003	0.003	0.005	0.009	0.009	0.004
08:00 AM - 09:00 AM	0.010	0.004	0.007	0.006	0.010	0.010	0.009
09:00 AM - 10:00 AM	0.010	0.007	0.007	0.008	0.009	0.009	0.008
10:00 AM - 11:00 AM	0.005	0.005	0.005	0.006	0.004	0.006	0.005
Average	0.007	0.005	0.004	0.006	0.005	0.007	0.005
1hr - Maximum	0.014	0.010	0.011	0.012	0.012	0.011	0.012
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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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID : 22108358
Date Received : Sep 14, 2022
Date Reported : Sep 22, 2022
Report Number : 2421135-1

Page 1 of 2

Sample Number 22108358-1 to 7
Parameter Wind Speed / Wind Direction
Location วัดหนองพูน (GPS 47P 0729819, 1403299)
Sampling Date Sep 05 - Sep 12, 2022
Sampling by Satcha Phetsawaeng

Time	Sep 05 - Sep 06, 2022		Sep 06 - Sep 07, 2022		Sep 07 - Sep 08, 2022		Sep 08 - Sep 09, 2022		Sep 09 - Sep 10, 2022		Sep 10 - Sep 11, 2022		Sep 11 - Sep 12, 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	1.2	198.0	SSW	0.5	269.0	W	1.6	339.0	NNW	1.6	267.0	W	0.2	-
11:00 AM - 12:00 PM	1.1	177.0	S	2.4	248.0	WSW	0.5	260.0	W	0.8	302.0	WNW	1.5	331.0
12:00 PM - 01:00 PM	2.2	284.0	WNW	3.7	207.0	SSW	3.2	320.0	NW	1.5	284.0	WNW	2.6	342.0
01:00 PM - 02:00 PM	1.1	134.0	SE	2.3	254.0	WSW	0.8	285.0	WNW	1.9	310.0	NW	0.7	274.0
02:00 PM - 03:00 PM	1.0	292.0	WNW	1.0	256.0	WSW	0.4	286.0	WNW	2.0	278.0	W	3.0	232.0
03:00 PM - 04:00 PM	0.3	315.0	NW	3.4	189.0	S	1.7	279.0	W	1.3	298.0	WNW	1.4	208.0
04:00 PM - 05:00 PM	1.8	35.0	NE	2.1	230.0	SW	1.5	279.0	W	2.0	322.0	NW	2.6	278.0
05:00 PM - 06:00 PM	0.3	156.0	SSE	1.3	261.0	W	0.4	315.0	NW	1.3	322.0	NW	0.3	311.0
06:00 PM - 07:00 PM	0.4	240.0	WSW	1.1	273.0	W	0.5	315.0	NW	1.4	323.0	NW	1.5	333.0
07:00 PM - 08:00 PM	0.5	264.0	W	0.5	261.0	W	0.3	22.0	NNE	1.5	322.0	NW	2.1	241.0
08:00 PM - 09:00 PM	0.5	258.0	WSW	1.1	267.0	W	0.9	39.0	NE	0.2	-	-	0.8	146.0
09:00 PM - 10:00 PM	0.5	359.0	N	0.8	292.0	WNW	0.3	324.0	NW	0.9	359.0	N	0.2	-
10:00 PM - 11:00 PM	1.3	359.0	N	0.2	-	-	1.2	342.0	NNW	0.3	300.0	WNW	0.2	-
11:00 PM - 12:00 AM	0.3	14.0	NNE	0.4	351.0	N	1.3	290.0	WNW	0.6	16.0	NNE	0.3	309.0
12:00 AM - 01:00 AM	0.2	-	-	2.3	48.0	NE	1.6	29.0	NNE	0.7	301.0	WNW	1.2	294.0
01:00 AM - 02:00 AM	0.2	-	-	1.5	324.0	NW	1.5	350.0	N	0.3	302.0	WNW	1.3	302.0
02:00 AM - 03:00 AM	0.2	-	-	1.6	290.0	WNW	1.6	345.0	NNW	0.8	302.0	WNW	1.5	11.0
03:00 AM - 04:00 AM	1.3	310.0	NW	1.5	246.0	WSW	1.5	294.0	WNW	1.3	309.0	NW	0.9	323.0
04:00 AM - 05:00 AM	1.2	310.0	NW	1.4	300.0	WNW	0.5	356.0	N	1.5	309.0	NW	1.8	0.0
05:00 AM - 06:00 AM	0.2	-	-	1.5	298.0	WNW	1.6	337.0	NNW	1.6	309.0	NW	1.3	330.0
06:00 AM - 07:00 AM	2.1	310.0	NW	1.5	290.0	WNW	1.5	330.0	NNW	1.5	308.0	NW	1.5	302.0
07:00 AM - 08:00 AM	1.1	16.0	NNE	1.5	259.0	W	1.4	281.0	W	1.8	240.0	WSW	0.5	358.0
08:00 AM - 09:00 AM	0.8	273.0	W	1.6	20.0	NNE	1.0	262.0	W	1.5	277.0	W	0.2	-
09:00 AM - 10:00 AM	0.2	-	-	0.8	9.0	N	1.1	266.0	W	1.0	268.0	W	0.6	35.0

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Approved by

Sarayuth Jitranont
Assistant General Manager

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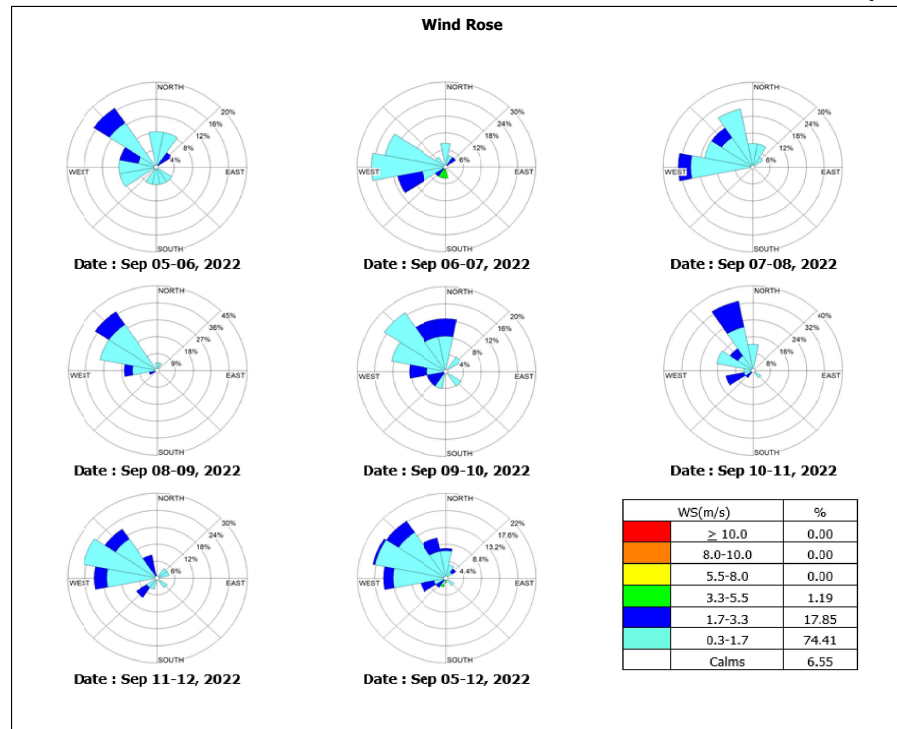


Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID : 22108358
Date Received : Sep 14, 2022
Date Reported : Sep 22, 2022
Report Number : 2421135-1

Page 2 of 2



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Sarayuth Jitranont
Assistant General Manager

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22107860
Date Received : Sep 06, 2022
Date Reported : Sep 16, 2022
Report Number : 2420223-1

Page 1 of 1

Sample Number	22107860-1
Sample Description	Emission from Stationary Source
Location	HRS #1
Measurement Date	Sep 06, 2022

		Stack Description			
Ambient Temperature	30 °C	Diameter	3.30 m	Oxygen	13.48 %
Ambient Pressure	758 mmHg	Shape	Circle	Carbon dioxide	4.19 %
Type of Process	Combustion	Stack Temperature	163 °C	Gas Velocity	21.11 m/s
Type of Fuel	Natural Gas	Moisture	9.01 %	Flow Rate	403332 Nm ³ /hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)	
				at Actual O ₂	At 7% O ₂
1	12:05 PM - 12:25 PM	13.42	4.22	9.86	18.33
2	12:26 PM - 12:46 PM	13.43	4.22	9.75	18.16
3	12:47 PM - 01:07 PM	13.59	4.13	9.16	17.41
Average (ppm)		13.48	4.19	9.59	17.96
Guideline ^{1/} (ppm)				-	35
Guideline ^{2/} (ppm)				-	120
Guideline ^{3/} (ppm)				-	120
Result (mg/Nm ³)				18.05	33.80
Emission Rate at Actual O ₂ (g/s)				2.0217	
Guideline ^{3/} (g/s)				3.55	
Method				US EPA Method 7E	

Sampled By : Saksit Phaisanphisit

Guideline : ^{1/}Environmental Impact Assessment Report of Global Power Synergy Public Company Limited (CUP 1)

^{2/}Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).

^{3/}Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Technical Management

Wichan Choonharat

Wichan Choonharat
Manager
ทะเบียนเลขที่ ว-204-ค-6113

Approved by

Sarayu Thitranont

Sarayu Thitranont
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-4702

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1



TESTING
No.0042

Lot ID: 22107874
Date Received : Sep 06, 2022
Date Reported : Sep 14, 2022
Report Number : 2420945-1

Page 1 of 2

Sample Number	22107874-1
Sampled Date	Sep 06, 2022
Sample Description	Emission from Stationary Source
Location	HRS #1
Date Analysis Commenced	Sep 08, 2022
Condition of Sample	Extracted into one filter paper placed in plastic petri dish and one plastic bottle

		Stack Description			
Ambient Pressure	758 mmHg	Diameter	3.30 m	Oxygen	13.5 %
Ambient Temperature	30.0 °C	Shape	Circle	Carbon Dioxide	4.2 %
Type of Process	Combustion	Stack Temperature	162 °C	Gas Velocity	21.1 m/s
Type of Fuel	Natural Gas	Moisture	9.10 %	Flow Rate (Actual O ₂)	402507 Nm ³ /hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 %O ₂ at 13.5 % O ₂		Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing										
Total Suspended Particulate	12:12 PM - 01:00 PM	mg/m3	-	0.5	<0.5	<0.5	60	3.20	US EPA, Method 5	Rayong

Guideline :

Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 1)

Technical Management

Thanita Kulsuriwong

Thanita Kulsuriwong
Scientist (4)
ทะเบียนเลขที่ ว-323-จ-9447

Approved by

Dej Changchon

Dej Changchon
Senior Manager
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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22107874

Date Received : Sep 06, 2022
Date Reported : Sep 14, 2022
Report Number: 2420945-1

Page 2 of 2

Sample Number 22107874-1
Sampled Date Sep 06, 2022
Sample Description Emission from Stationary Source
Location HRSG #1
Date Analysis Commenced Sep 08, 2022
Condition of Sample Extracted into one filter paper placed in plastic petri dish and one plastic bottle

Stack Description

Ambient Pressure	758	mmHg	Diameter	3.30	m	Oxygen	13.5	%
Ambient Temperature	30.0	°C	Shape	Circle		Carbon Dioxide	4.2	%
Type of Process	Combustion		Stack Temperature	162	°C	Gas Velocity	21.1	m/s
Type of Fuel	Natural Gas		Moisture	9.10	%	Flow Rate (Actual O2)	402507	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	12:12 PM - 01:00 PM	g/s	-	-	<0.056	-	0.40	Calculated	Rayong

Guideline :

Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 1)

Sampled By : Tinnakorn Kulchart , Prasanmit Kueanpet

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

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Dej Choonharat
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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22107862

Date Received : Sep 10, 2022
Date Reported : Sep 16, 2022
Report Number : 2420225-1

Page 1 of 1

Sample Number 22107862-1
Sample Description Emission from Stationary Source
Location HRSG #2
Measurement Date Sep 09, 2022

Stack Description

Ambient Temperature	30	°C	Diameter	3.30	m	Oxygen	13.35	%
Ambient Pressure	758	mmHg	Shape	Circle		Carbon dioxide	4.26	%
Type of Process	Combustion		Stack Temperature	157	°C	Gas Velocity	20.86	m/s
Type of Fuel	Natural Gas		Moisture	8.52	%	Flow Rate	406297	Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)	
				at Actual O ₂	At 7% O ₂
1	10:00 AM - 10:20 AM	13.36	4.25	12.03	22.18
2	10:21 AM - 10:41 AM	13.43	4.23	12.02	22.35
3	10:42 AM - 11:02 AM	13.27	4.30	12.09	22.04
Average (ppm)		13.35	4.26	12.05	22.19
Guideline ^{1/} (ppm)				-	35
Guideline ^{2/} (ppm)				-	120
Guideline ^{3/} (ppm)				-	120
Result (mg/Nm ³)				22.67	41.75
Emission Rate at Actual O ₂ (g/s)					2.5580
Guideline ^{4/} (g/s)					3.55
Method					US EPA Method 7E

Sampled By : Saksit Phaisanphisit

Guideline : ^{1/} Environmental Impact Assessment Report of Global Power Synergy Public Company Limited (CUP 1)

^{2/} Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).

^{3/} Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Technical Management

Wichan Choonharat

Wichan Choonharat
Manager
ทะเบียนเลขที่ ๖-204-๖-6113

Approved by

Sarayuht Jitranont

Sarayuth Jitranont
Assistant General Manager
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Analysis / Test Report



TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108199
Date Received : Sep 09, 2022
Date Reported : Sep 17, 2022
Report Number: 2420948-1

Page 1 of 2

Sample Number	22108199-1
Sampled Date	Sep 09, 2022
Sample Description	Emission from Stationary Source
Location	HRS# #2
Date Analysis Commenced	Sep 10, 2022
Condition of Sample	Extracted into one filter paper placed in plastic petri dish and one plastic bottle

Stack Description									
Ambient Pressure	758	mmHg	Diameter	3.30	m	Oxygen	13.4	%	
Ambient Temperature	30.0	°C	Shape	Circle		Carbon Dioxide	4.3	%	
Type of Process	Combustion		Stack Temperature	156	°C	Gas Velocity	21.1	m/s	
Type of Fuel	Natural Gas		Moisture	8.52	%	Flow Rate (Actual O2)	410654	Nm3/hr	

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 % O ₂	Result at 13.4 % O ₂	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing										
Total Suspended Particulate	10:10 AM - 10:58 AM	mg/m3	-	0.5	<0.5	<0.5	60	3.20	US EPA, Method 5	Rayong

Guideline :

Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 1)

Technical Management

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Approved by

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Dej Changchon
Senior Manager
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Analysis / Test Report



TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108199
Date Received : Sep 09, 2022
Date Reported : Sep 17, 2022
Report Number: 2420948-1

Page 2 of 2

Sample Number	22108199-1
Sampled Date	Sep 09, 2022
Sample Description	Emission from Stationary Source
Location	HRS# #2
Date Analysis Commenced	Sep 10, 2022
Condition of Sample	Extracted into one filter paper placed in plastic petri dish and one plastic bottle

Stack Description									
Ambient Pressure	758	mmHg	Diameter	3.30	m	Oxygen	13.4	%	
Ambient Temperature	30.0	°C	Shape	Circle		Carbon Dioxide	4.3	%	
Type of Process	Combustion		Stack Temperature	156	°C	Gas Velocity	21.1	m/s	
Type of Fuel	Natural Gas		Moisture	8.52	%	Flow Rate (Actual O2)	410654	Nm3/hr	

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	10:10 AM - 10:58 AM	g/s	-	-	<0.057	-	0.40	Calculated	Rayong

Guideline :

Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 1)

Sampled By : Tinnakorn Kulchart , Prasanmit Kueanpet

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

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Approved by

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Dej Changchon
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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108206
Date Received : Sep 08, 2022
Date Reported : Sep 16, 2022
Report Number : 2420963-1

Page 1 of 1

Sample Number	22108206-1
Sample Description	Emission from Stationary Source
Location	HRSG #3
Measurement Date	Sep 07, 2022

		Stack Description			
Ambient Temperature	30 °C	Diameter	3.30 m	Oxygen	13.06 %
Ambient Pressure	758 mmHg	Shape	Circle	Carbon dioxide	4.38 %
Type of Process	Combustion	Stack Temperature	121 °C	Gas Velocity	18.80 m/s
Type of Fuel	Natural Gas	Moisture	8.19 %	Flow Rate	401120 Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)	
				at Actual O ₂	At 7% O ₂
1	11:20 AM - 11:40 AM	13.15	4.33	11.31	20.27
2	11:41 AM - 12:01 PM	13.02	4.40	11.21	19.78
3	12:02 PM - 12:22 PM	13.00	4.43	10.86	19.11
Average (ppm)		13.06	4.38	11.13	19.72
Guideline ^{1/} (ppm)				-	48
Guideline ^{2/} (ppm)				-	120
Guideline ^{3/} (ppm)				-	120
Result (mg/Nm ³)				20.93	37.10
Emission Rate at Actual O ₂ (g/s)				2.3322	
Guideline ^{1/} (g/s)				5.07	
Method				US EPA Method 7E	

Sampled By : Saksit Phaisanphisit

Guideline : ^{1/} Environmental Impact Assessment Report of Global Power Synergy Public Company Limited (CUP 1)

^{2/} Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).

^{3/} Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Technical Management

Wichan Choonharat

Wichan Choonharat
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Approved by

Sarayuht Jitranont

Sarayuht Jitranont
Assistant General Manager
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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1



TESTING
No.0042

Lot ID: 22108220
Date Received : Sep 07, 2022
Date Reported : Sep 15, 2022
Report Number : 2421000-1

Page 1 of 2

Sample Number	22108220-1
Sampled Date	Sep 07, 2022
Sample Description	Emission from Stationary Source
Location	HRSG #3
Date Analysis Commenced	Sep 08, 2022
Condition of Sample	Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

		Stack Description			
Ambient Pressure	758 mmHg	Diameter	3.30 m	Oxygen	13.1 %
Ambient Temperature	30.0 °C	Shape	Circle	Carbon Dioxide	4.4 %
Type of Process	Combustion	Stack Temperature	120 °C	Gas Velocity	18.8 m/s
Type of Fuel	Natural Gas	Moisture	8.18 %	Flow Rate (Actual O ₂)	400681 Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 % O ₂	Result at 13.1 % O ₂	Guideline (1)	Guideline (2)	Method	Testing Location
Total Suspended Particulate	11:30 AM - 12:18 PM	mg/m3	-	0.5	<0.5	<0.5	60	3.00	US EPA, Method 5	Rayong

Guideline :

Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 1)

Technical Management

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Approved by

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Analysis / Test Report



TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108220

Date Received : Sep 07, 2022
Date Reported : Sep 15, 2022
Report Number: 2421000-1

Page 2 of 2

Sample Number	22108220-1
Sampled Date	Sep 07, 2022
Sample Description	Emission from Stationary Source
Location	HRSG #3
Date Analysis Commenced	Sep 08, 2022
Condition of Sample	Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	758	mmHg	Diameter	3.30	m	Oxygen	13.1	%
Ambient Temperature	30.0	°C	Shape	Circle		Carbon Dioxide	4.4	%
Type of Process	Combustion		Stack Temperature	120	°C	Gas Velocity	18.8	m/s
Type of Fuel	Natural Gas		Moisture	8.18	%	Flow Rate (Actual O2)	400681	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	11:30 AM - 12:18 PM	g/s	-	-	<0.056	-	0.40	Calculated	Rayong

Guideline :

Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 1)

Sampled By : Tinnakorn Kulchart , Prasanmit Kueanpet

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

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108209

Date Received : Sep 08, 2022
Date Reported : Sep 16, 2022
Report Number : 2420966-1

Page 1 of 1

Sample Number	22108209-1
Sample Description	Emission from Stationary Source
Location	HRSG #4
Measurement Date	Sep 08, 2022

Stack Description

Ambient Temperature	30	°C	Diameter	3.30	m	Oxygen	13.31	%
Ambient Pressure	758	mmHg	Shape	Circle		Carbon dioxide	4.25	%
Type of Process	Combustion		Stack Temperature	122	°C	Gas Velocity	19.58	m/s
Type of Fuel	Natural Gas		Moisture	8.09	%	Flow Rate	416674	Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)	
				at Actual O ₂	At 7% O ₂
1	10:10 AM - 10:30 AM	13.33	4.25	3.07	5.65
2	10:31 AM - 10:51 AM	13.33	4.26	3.23	5.92
3	10:52 AM - 11:12 AM	13.28	4.25	3.20	5.84
Average (ppm)		13.31	4.25	3.17	5.80
Guideline ^{1/} (ppm)				-	32
Guideline ^{2/} (ppm)				-	120
Guideline ^{3/} (ppm)				-	120
Result (mg/Nm ³)				5.96	10.92
Emission Rate at Actual O ₂ (g/s)				0.6896	
Guideline ^{1/} (g/s)				2.84	
Method				US EPA Method 7E	

Sampled By : Saksit Phaisanphisit

Guideline : ^{1/} Environmental Impact Assessment Report of Global Power Synergy Public Company Limited (CUP 1)

^{2/} Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).

^{3/} Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Technical Management

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Wichan Choonharat
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Approved by

Sarayuht Jitranont

Sarayuth Jitranont
Assistant General Manager
ทะเบียนเลขที่ ๖-204-๖-4702

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Analysis / Test Report



TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108237
Date Received : Sep 08, 2022
Date Reported : Sep 16, 2022
Report Number: 2421004-1

Page 1 of 2

Sample Number	22108237-1
Sampled Date	Sep 08, 2022
Sample Description	Emission from Stationary Source
Location	HRS# 4
Date Analysis Commenced	Sep 09, 2022
Condition of Sample	Contained in one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description									
Ambient Pressure	758	mmHg	Diameter	3.30	m	Oxygen	13.3	%	
Ambient Temperature	30.0	°C	Shape	Circle		Carbon Dioxide	4.2	%	
Type of Process	Combustion		Stack Temperature	122	°C	Gas Velocity	19.6	m/s	
Type of Fuel	Natural Gas		Moisture	8.06	%	Flow Rate (Actual O2)	416276	Nm3/hr	

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 % O ₂	Result at 13.3 % O ₂	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing										
Total Suspended Particulate	10:15 AM - 11:03 AM	mg/m3	-	0.5	<0.5	<0.5	60	3.60	US EPA, Method 5	Rayong

Guideline :

Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 1)

Technical Management

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Scientist (4)
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Approved by

D. Amorn.

Dej Changchon
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S:\Reports_Air_Stack_O2_2GL.rpt (11:47AM)



Analysis / Test Report



TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108237
Date Received : Sep 08, 2022
Date Reported : Sep 16, 2022
Report Number: 2421004-1

Page 2 of 2

Sample Number	22108237-1
Sampled Date	Sep 08, 2022
Sample Description	Emission from Stationary Source
Location	HRS# 4
Date Analysis Commenced	Sep 09, 2022
Condition of Sample	Contained in one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description									
Ambient Pressure	758	mmHg	Diameter	3.30	m	Oxygen	13.3	%	
Ambient Temperature	30.0	°C	Shape	Circle		Carbon Dioxide	4.2	%	
Type of Process	Combustion		Stack Temperature	122	°C	Gas Velocity	19.6	m/s	
Type of Fuel	Natural Gas		Moisture	8.06	%	Flow Rate (Actual O2)	416276	Nm3/hr	

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	10:15 AM - 11:03 AM	g/s	-	-	<0.058	-	0.40	Calculated	Rayong

Guideline :

Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 1)

Sampled By : Tinnakorn Kulchart , Prasanmit Kueanpet

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

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108210
Date Received : Sep 08, 2022
Date Reported : Sep 16, 2022
Report Number : 2420968-1

Page 1 of 1

Sample Number	22108210-1
Sample Description	Emission from Stationary Source
Location	HRSG #5
Measurement Date	Sep 08, 2022

Stack Description					
Ambient Temperature	30	°C	Diameter	3.30	m
Ambient Pressure	758	mmHg	Shape	Circle	
Type of Process	Combustion		Stack Temperature	171	°C
Type of Fuel	Natural Gas		Moisture	10.46	%
			Oxygen	13.19	%
			Carbon dioxide	4.34	%
			Gas Velocity	23.33	m/s
			Flow Rate	429969	Nm ³ /hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)	
				at Actual O ₂	At 7% O ₂
1	01:50 PM - 02:10 PM	13.24	4.33	2.60	4.72
2	02:11 PM - 02:31 PM	13.16	4.33	2.61	4.69
3	02:32 PM - 02:52 PM	13.17	4.34	2.60	4.68
Average (ppm)		13.19	4.34	2.60	4.69
Guideline ^{1/} (ppm)				-	20
Guideline ^{2/} (ppm)				-	120
Guideline ^{3/} (ppm)				-	120
Result (mg/Nm ³)				4.90	8.83
Emission Rate at Actual O ₂ (g/s)				0.5851	
Guideline ^{1/} (g/s)				2.82	
Method				US EPA Method 7E	

Sampled By : Saksit Phaisanphisit

Guideline : ^{1/} Environmental Impact Assessment Report of Global Power Synergy Public Company Limited (CUP 1)

^{2/} Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).

^{3/} Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Technical Management

Wichan Choonharat

Wichan Choonharat
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Approved by

Sarayuht Jitranont

Sarayuht Jitranont
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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1



TESTING
No.0042

Lot ID: 22108238
Date Received : Sep 08, 2022
Date Reported : Sep 16, 2022
Report Number : 2421007-1

Page 1 of 2

Sample Number	22108238-1
Sampled Date	Sep 08, 2022
Sample Description	Emission from Stationary Source
Location	HRSG #5
Date Analysis Commenced	Sep 09, 2022
Condition of Sample	Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description					
Ambient Pressure	758	mmHg	Diameter	3.30	m
Ambient Temperature	30.0	°C	Shape	Circle	
Type of Process	Combustion		Stack Temperature	171	°C
Type of Fuel	Natural Gas		Moisture	10.47	%
			Oxygen	13.2	%
			Carbon Dioxide	4.3	%
			Gas Velocity	23.3	m/s
			Flow Rate (Actual O ₂)	429387	Nm ³ /hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 % O ₂	Result at 13.2 % O ₂	Guideline (1)	Guideline (2)	Method	Testing Location
Total Suspended Particulate	02:00 PM - 03:00 PM	mg/m ³	-	0.5	<0.5	<0.5	60	2.30	US EPA, Method 5	Rayong

Guideline :

Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 1)

Technical Management

Thanita Kulsuriwong

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108238
Date Received : Sep 08, 2022
Date Reported : Sep 16, 2022
Report Number: 2421007-1

Page 2 of 2

Sample Number 22108238-1
Sampled Date Sep 08, 2022
Sample Description Emission from Stationary Source
Location HRSG #5
Date Analysis Commenced Sep 09, 2022
Condition of Sample Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description

Ambient Pressure	758	mmHg	Diameter	3.30	m	Oxygen	13.2	%
Ambient Temperature	30.0	°C	Shape	Circle		Carbon Dioxide	4.3	%
Type of Process	Combustion		Stack Temperature	171	°C	Gas Velocity	23.3	m/s
Type of Fuel	Natural Gas		Moisture	10.47	%	Flow Rate (Actual O2)	429387	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	02:00 PM - 03:00 PM	g/s	-	-	<0.060	-	0.40	Calculated	Rayong

Guideline :

Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 1)

Sampled By : Tinnakorn Kulchart , Prasanmit Kueanpet

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

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Approved by

D. Choonharat

Dej Choonharat
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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108211
Date Received : Sep 10, 2022
Date Reported : Sep 16, 2022
Report Number : 2420971-1

Page 1 of 1

Sample Number 22108211-1
Sample Description Emission from Stationary Source
Location HRSG #6
Measurement Date Sep 09, 2022

Stack Description

Ambient Temperature	30	°C	Diameter	3.30	m	Oxygen	12.88	%
Ambient Pressure	758	mmHg	Shape	Circle		Carbon dioxide	4.52	%
Type of Process	Combustion		Stack Temperature	165	°C	Gas Velocity	20.65	m/s
Type of Fuel	Natural Gas		Moisture	8.94	%	Flow Rate	392570	Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)	
				at Actual O ₂	At 7% O ₂
1	11:55 AM - 12:15 PM	12.86	4.53	6.77	11.69
2	12:16 PM - 12:36 PM	12.89	4.51	6.47	11.22
3	12:37 PM - 12:57 PM	12.89	4.51	6.69	11.60
Average (ppm)		12.88	4.52	6.64	11.51
Guideline ^{1/} (ppm)				-	20
Guideline ^{2/} (ppm)				-	120
Guideline ^{3/} (ppm)				-	120
Result (mg/Nm ³)				12.49	21.65
Emission Rate at Actual O ₂ (g/s)					1.3625
Guideline ^{1/} (g/s)					2.82
Method					US EPA Method 7E

Sampled By : Saksit Phaisanphisit

Guideline : ^{1/} Environmental Impact Assessment Report of Global Power Synergy Public Company Limited (CUP 1)

^{2/} Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).

^{3/} Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Technical Management

Wichan Choonharat

Wichan Choonharat
Manager
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Approved by

Sarayuht Jitranont

Sarayuth Jitranont
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Analysis / Test Report



TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108239
Date Received : Sep 09, 2022
Date Reported : Sep 17, 2022
Report Number: 2421010-1

Page 1 of 2

Sample Number	22108239-1
Sampled Date	Sep 09, 2022
Sample Description	Emission from Stationary Source
Location	HRS #6
Date Analysis Commenced	Sep 10, 2022
Condition of Sample	Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description									
Ambient Pressure	758	mmHg	Diameter	3.30	m	Oxygen	12.9	%	
Ambient Temperature	30.0	°C	Shape	Circle		Carbon Dioxide	4.5	%	
Type of Process	Combustion		Stack Temperature	165	°C	Gas Velocity	20.6	m/s	
Type of Fuel	Natural Gas		Moisture	8.98	%	Flow Rate (Actual O2)	391959	Nm3/hr	

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 % O ₂	Result at 12.9 % O ₂	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing										
Total Suspended Particulate	12:00 PM - 12:42 PM	mg/m3	-	0.5	<0.5	<0.5	60	2.30	US EPA, Method 5	Rayong

Guideline :

Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 1)

Technical Management

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Approved by

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Dej Changchon
Senior Manager
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Analysis / Test Report



TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108239
Date Received : Sep 09, 2022
Date Reported : Sep 17, 2022
Report Number: 2421010-1

Page 2 of 2

Sample Number	22108239-1
Sampled Date	Sep 09, 2022
Sample Description	Emission from Stationary Source
Location	HRS #6
Date Analysis Commenced	Sep 10, 2022
Condition of Sample	Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one amber plastic bottle, refrigerated

Stack Description									
Ambient Pressure	758	mmHg	Diameter	3.30	m	Oxygen	12.9	%	
Ambient Temperature	30.0	°C	Shape	Circle		Carbon Dioxide	4.5	%	
Type of Process	Combustion		Stack Temperature	165	°C	Gas Velocity	20.6	m/s	
Type of Fuel	Natural Gas		Moisture	8.98	%	Flow Rate (Actual O2)	391959	Nm3/hr	

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	12:00 PM - 12:42 PM	g/s	-	-	<0.054	-	0.40	Calculated	Rayong

Guideline :

Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 1)

Sampled By : Tinnakorn Kulchart , Prasanmit Kueanpet

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

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22107863
Date Received : Sep 06, 2022
Date Reported : Sep 16, 2022
Report Number : 2420227-1

Page 1 of 1

Sample Number	22107863-1
Sample Description	Emission from Stationary Source
Location	Auxiliary Boiler
Measurement Date	Sep 06, 2022

Stack Description					
Ambient Temperature	30	°C	Diameter	1.80	m
Ambient Pressure	758	mmHg	Shape	Circle	
Type of Process	Combustion		Stack Temperature	177	°C
Type of Fuel	Natural Gas		Moisture	7.51	%
			Oxygen	11.65	%
			Carbon dioxide	5.16	%
			Gas Velocity	6.86	m/s
			Flow Rate	38386	Nm ³ /hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)	
				at Actual O ₂	At 7% O ₂
1	10:00 AM - 10:20 AM	11.64	5.15	27.30	40.97
2	10:21 AM - 10:41 AM	11.65	5.16	27.45	41.24
3	10:42 AM - 11:02 AM	11.66	5.18	27.32	41.12
Average (ppm)		11.65	5.16	27.36	41.11
Guideline ^{1/} (ppm)				-	53
Guideline ^{2/} (ppm)				-	120
Guideline ^{3/} (ppm)				-	120
Result (mg/Nm ³)				51.47	77.34
Emission Rate at Actual O ₂ (g/s)				0.5488	
Guideline ^{1/} (g/s)				2.10	
Method				US EPA Method 7E	

Sampled By : Saksit Phaisanphisit

Guideline : ^{1/} Environmental Impact Assessment Report of Global Power Synergy Public Company Limited (CUP 1)

^{2/} Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).

^{3/} Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Technical Management

Wichan Choonharat

Wichan Choonharat
Manager
ทะเบียนเลขที่ ๖-204-๓-6113

Approved by

Sarayuth Jittranont

Sarayuth Jittranont
Assistant General Manager
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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1



TESTING

No.0042

Lot ID: 22108200

Date Received : Sep 06, 2022
Date Reported : Sep 14, 2022
Report Number : 2420950-1

Page 1 of 2

Sample Number	22108200-1
Sampled Date	Sep 06, 2022
Sample Description	Emission from Stationary Source
Location	Auxiliary Boiler
Date Analysis Commenced	Sep 08, 2022
Condition of Sample	Extracted into one filter paper placed in plastic petri dish and one plastic bottle

Stack Description					
Ambient Pressure	758	mmHg	Diameter	1.80	m
Ambient Temperature	30.0	°C	Shape	Circle	
Type of Process	Combustion		Stack Temperature	177	°C
Type of Fuel	Natural Gas		Moisture	7.52	%
			Oxygen	11.6	%
			Carbon Dioxide	5.2	%
			Gas Velocity	6.8	m/s
			Flow Rate (Actual O ₂)	38339	Nm ³ /hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 % O ₂ at 11.6 % O ₂	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate	10:10 AM - 10:58 AM	mg/m ³	-	0.5	<0.5	<0.5	60	1.20	US EPA, Method 5 Rayong

Guideline :

Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 1)

Technical Management

Thanitak K.

Thanitak Kulsuriwong
Scientist (4)
ทะเบียนเลขที่ ๖-323-๓-9447

Approved by

D. Chongchon

Dej Changchon
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ทะเบียนเลขที่ ๖-323-๓-9442

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S:\Reports_Air Stack_O2_2GL.rpt (4:02PM)



Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108200

Date Received : Sep 06, 2022

Date Reported : Sep 14, 2022

Report Number: 2420950-1

Page 2 of 2

Sample Number	22108200-1
Sampled Date	Sep 06, 2022
Sample Description	Emission from Stationary Source
Location	Auxiliary Boiler
Date Analysis Commenced	Sep 08, 2022
Condition of Sample	Extracted into one filter paper placed in plastic petri dish and one plastic bottle

Stack Description

Ambient Pressure	758	mmHg	Diameter	1.80	m	Oxygen	11.6	%
Ambient Temperature	30.0	°C	Shape	Circle		Carbon Dioxide	5.2	%
Type of Process	Combustion		Stack Temperature	177	°C	Gas Velocity	6.8	m/s
Type of Fuel	Natural Gas		Moisture	7.52	%	Flow Rate (Actual O2)	38339	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	10:10 AM - 10:58 AM	g/s	-	-	<0.005	-	0.019	Calculated	Rayong

Guideline :

Guideline (1) : Notification of the Ministry of Industry on determining pollutant contents in air emitted from electric power generation, transmission and distribution plant, 2004 (B.E. 2547), dated September, 2004 (B.E. 2547).
: Notification of the Ministry of Natural Resources and Environment, 2010 (B.E. 2553) on Emission Standard from New Power Plants.

Guideline (2) : Environmental Impact Assessment Report of Global Power Synergy Public Company Limited. (CUP 1)

Sampled By : Tinnakorn Kulchart , Prasanmit Kueanpet

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

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Thanita Kulsurivong
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Approved by

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Dej Changchon
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S:\Reports\Air Stack_O2_2GL.rpt (4:02PM)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108263
Date Received : Sep 12, 2022
Date Reported : Sep 23, 2022
Report Number : 2421036-1

Page 1 of 10

Sample Number 22108263-1
Sampled Date Sep 12, 2022
Sample Description Air Quality
Location มัธยม HRSG #3
Date Analysis Commenced Sep 13, 2022
Condition of Sample Drawn into one amber plastic bottle, refrigerated
Barometric Pressure 757 mmHg
Atmospheric Temperature 29.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Ammonia	10:00 AM - 12:00 PM	ppm	-	0.10	<0.10	50	Based on Method of Air Sampling and Analysis, 401	MOL	Rayong

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 : Tarin Octjinda

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

Approved by

Saranya C.

Saranya Chalermtamrong
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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108263
Date Received : Sep 12, 2022
Date Reported : Sep 23, 2022
Report Number : 2421036-1

Page 2 of 10

Sample Number 22108263-2
Sampled Date Sep 12, 2022
Sample Description Air Quality
Location มัธยม HRSG #4
Date Analysis Commenced Sep 13, 2022
Condition of Sample Drawn into one amber plastic bottle, refrigerated
Barometric Pressure 757 mmHg
Atmospheric Temperature 29.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Ammonia	10:00 AM - 12:00 PM	ppm	-	0.10	<0.10	50	Based on Method of Air Sampling and Analysis, 401	MOL	Rayong

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 : Tarin Octjinda

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

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P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108263
Date Received : Sep 12, 2022
Date Reported : Sep 23, 2022
Report Number : 2421036-1

Page 3 of 10

Sample Number 22108263-3
Sampled Date Sep 12, 2022
Sample Description Air Quality
Location มัธยม HRSG #5
Date Analysis Commenced Sep 13, 2022
Condition of Sample Drawn into one amber plastic bottle, refrigerated
Barometric Pressure 757 mmHg
Atmospheric Temperature 29.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Ammonia	10:00 AM - 12:00 PM	ppm	-	0.10	<0.10	50	Based on Method of Air Sampling and Analysis, 401	MOL	Rayong

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 : Tarin Octjinda

Remark :
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P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108263
Date Received : Sep 12, 2022
Date Reported : Sep 23, 2022
Report Number : 2421036-1

Page 4 of 10

Sample Number 22108263-4
Sampled Date Sep 12, 2022
Sample Description Air Quality
Location มัธยม HRSG #6
Date Analysis Commenced Sep 13, 2022
Condition of Sample Drawn into one amber plastic bottle, refrigerated
Barometric Pressure 757 mmHg
Atmospheric Temperature 29.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Ammonia	10:00 AM - 12:00 PM	ppm	-	0.10	<0.10	50	Based on Method of Air Sampling and Analysis, 401	MOL	Rayong

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 : Tarin Octjinda

Remark :
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P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108263
Date Received : Sep 12, 2022
Date Reported : Sep 23, 2022
Report Number : 2421036-1

Page 5 of 10

Sample Number 22108263-5
Sampled Date Sep 12, 2022
Sample Description Air Quality
Location NH4OH Tank
Date Analysis Commenced Sep 13, 2022
Condition of Sample Drawn into one amber plastic bottle, refrigerated
Barometric Pressure 757 mmHg
Atmospheric Temperature 29.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Ammonia	10:00 AM - 12:00 PM	ppm	-	0.10	<0.10	50	Based on Method of Air Sampling and Analysis, 401	MOL	Rayong

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 : Tarin Octjinda

Remark :
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P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108263
Date Received : Sep 12, 2022
Date Reported : Sep 23, 2022
Report Number : 2421036-1

Page 6 of 10

Sample Number 22108263-6
Sampled Date Sep 12, 2022
Sample Description Air Quality
Location Cooling Tower #1
Date Analysis Commenced Sep 21, 2022
Condition of Sample Drawn into one amber plastic bottle, refrigerated
Barometric Pressure 757 mmHg
Atmospheric Temperature 29.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Chlorine	10:00 AM - 12:00 PM	ppm	-	0.10	<0.10	1(C)	Based on OSHA, ID 101	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 : Tarin Octjinda

Remark :
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P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108263
Date Received : Sep 12, 2022
Date Reported : Sep 23, 2022
Report Number : 2421036-1

Page 7 of 10

Sample Number 22108263-7
Sampled Date Sep 12, 2022
Sample Description Air Quality
Location Cooling Tower #2
Date Analysis Commenced Sep 21, 2022
Condition of Sample Drawn into one amber plastic bottle, refrigerated
Barometric Pressure 757 mmHg
Atmospheric Temperature 29.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Chlorine	10:00 AM - 12:00 PM	ppm	-	0.10	<0.10	1(C)	Based on OSHA, ID 101	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 : Tarin Octjinda

Remark :

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

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108263
Date Received : Sep 12, 2022
Date Reported : Sep 23, 2022
Report Number : 2421036-1

Page 8 of 10

Sample Number 22108263-8
Sampled Date Sep 12, 2022
Sample Description Air Quality
Location Cooling Tower #3
Date Analysis Commenced Sep 21, 2022
Condition of Sample Drawn into one amber plastic bottle, refrigerated
Barometric Pressure 757 mmHg
Atmospheric Temperature 29.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Chlorine	10:00 AM - 12:00 PM	ppm	-	0.10	<0.10	1(C)	Based on OSHA, ID 101	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 : Tarin Octjinda

Remark :

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

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Analysis / Test Report

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92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108263
Date Received : Sep 12, 2022
Date Reported : Sep 23, 2022
Report Number : 2421036-1

Page 9 of 10

Sample Number 22108263-9
Sampled Date Sep 12, 2022
Sample Description Air Quality
Location Demin Plant #1
Date Analysis Commenced Sep 13, 2022
Condition of Sample Drawn into one filter paper placed in plastic cassette and one sorbent tube, refrigerated
Barometric Pressure 757 mmHg
Atmospheric Temperature 29.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Hydrogen chloride	10:00 AM - 12:00 PM	ppm	-	0.05	<0.05	5(C)	Based on OSHA, ID-174-SG	MOL	Bangkok
Sodium hydroxide as NaOH	10:00 AM - 12:00 PM	mg/m3	-	0.05	<0.05	2	NIOSH (1994), 7401	MOL	Rayong

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 : Tarin Octjinda

Remark :

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

Approved by

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
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P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108263
Date Received : Sep 12, 2022
Date Reported : Sep 23, 2022
Report Number : 2421036-1

Page 10 of 10

Sample Number 22108263-10
Sampled Date Sep 12, 2022
Sample Description Air Quality
Location Demin Plant #2
Date Analysis Commenced Sep 13, 2022
Condition of Sample Drawn into one filter paper placed in plastic cassette and one sorbent tube, refrigerated
Barometric Pressure 757 mmHg
Atmospheric Temperature 29.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Hydrogen chloride	10:00 AM - 12:00 PM	ppm	-	0.05	<0.05	5(C)	Based on OSHA, ID-174-SG	MOL	Bangkok
Sodium hydroxide as NaOH	10:00 AM - 12:00 PM	mg/m3	-	0.05	<0.05	2	NIOSH (1994), 7401	MOL	Rayong

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 : Tarin Octjinda

Remark :

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

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Analysis / Test Report



TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108343
Date Received : Sep 14, 2022
Date Reported : Sep 20, 2022
Report Number: 2439005-1

Page 1 of 1

Sample Number : 22108343-1
Parameter : Noise (Leq 24 hrs.)
Location : ครัวด้านทางเข้าโรงงาน (GPS 47P 0730813, 1405150)
Measurement Date : Sep 05 - Sep 06, 2022
Measurement by : Satcha Phetsawaeng
Sound Level meter : Serial No. 900071

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	68.2	85.3	64.6
10:00 AM - 11:00 AM	69.0	89.9	64.4
11:00 AM - 12:00 PM	68.9	89.0	64.8
12:00 PM - 01:00 PM	68.6	90.2	64.7
01:00 PM - 02:00 PM	69.4	89.3	64.8
02:00 PM - 03:00 PM	69.3	85.3	65.0
03:00 PM - 04:00 PM	69.1	83.7	65.0
04:00 PM - 05:00 PM	69.0	87.0	65.1
05:00 PM - 06:00 PM	69.3	84.5	65.0
06:00 PM - 07:00 PM	69.5	89.4	65.1
07:00 PM - 08:00 PM	69.0	83.9	65.6
08:00 PM - 09:00 PM	68.0	84.0	65.7
09:00 PM - 10:00 PM	66.7	87.3	65.0
10:00 PM - 11:00 PM	66.7	79.0	65.0
11:00 PM - 12:00 AM	66.2	83.9	64.8
12:00 AM - 01:00 AM	66.2	78.6	64.6
01:00 AM - 02:00 AM	66.0	79.4	64.7
02:00 AM - 03:00 AM	66.2	82.1	64.8
03:00 AM - 04:00 AM	67.0	82.2	64.9
04:00 AM - 05:00 AM	67.0	80.8	64.9
05:00 AM - 06:00 AM	67.5	84.0	65.0
06:00 AM - 07:00 AM	68.8	81.9	64.9
07:00 AM - 08:00 AM	68.7	86.0	64.5
08:00 AM - 09:00 AM	69.2	89.1	64.9

Leq Average 24 hrs. (dB(A)) : 68.2
Lmax (dB(A)) : 90.2
L90 (dB(A)) : 64.9
Ldn (dB(A)) : 73.7
Standard (dB(A)) : 70

Reference Method : ISO1996-1 and 1996-2

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

Remark :

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

Technical Management

Thanitak.

Thanita Kulsuriwong
Scientist (4)

Approved by

Supot S.

Supot Salamteh
Section Head

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S:\Reports_Air Noise.rpt (1:48PM)



Analysis / Test Report



TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108343
Date Received : Sep 14, 2022
Date Reported : Sep 20, 2022
Report Number: 2439006-1

Page 1 of 1

Sample Number : 22108343-2
Parameter : Noise (Leq 24 hrs.)
Location : ครัวด้านทางเข้าโรงงาน (GPS 47P 0730813, 1405150)
Measurement Date : Sep 06 - Sep 07, 2022
Measurement by : Satcha Phetsawaeng
Sound Level meter : Serial No. 900071

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	68.7	86.8	64.8
10:00 AM - 11:00 AM	68.4	85.2	64.8
11:00 AM - 12:00 PM	68.5	85.8	64.8
12:00 PM - 01:00 PM	68.3	87.0	64.8
01:00 PM - 02:00 PM	69.2	88.4	64.9
02:00 PM - 03:00 PM	69.5	88.4	65.4
03:00 PM - 04:00 PM	69.2	83.8	65.2
04:00 PM - 05:00 PM	69.6	85.5	65.5
05:00 PM - 06:00 PM	69.9	82.3	65.7
06:00 PM - 07:00 PM	69.7	86.3	65.4
07:00 PM - 08:00 PM	68.7	89.3	65.1
08:00 PM - 09:00 PM	67.2	83.0	64.8
09:00 PM - 10:00 PM	67.0	82.3	64.7
10:00 PM - 11:00 PM	67.2	84.2	64.7
11:00 PM - 12:00 AM	66.5	82.2	64.6
12:00 AM - 01:00 AM	65.2	79.2	64.4
01:00 AM - 02:00 AM	65.3	77.7	64.5
02:00 AM - 03:00 AM	67.1	80.9	65.4
03:00 AM - 04:00 AM	67.2	79.7	65.6
04:00 AM - 05:00 AM	68.0	83.0	66.0
05:00 AM - 06:00 AM	68.3	82.8	65.8
06:00 AM - 07:00 AM	69.1	84.8	65.5
07:00 AM - 08:00 AM	66.8	79.7	65.0
08:00 AM - 09:00 AM	65.9	83.6	64.6

Leq Average 24 hrs. (dB(A)) : 68.1
Lmax (dB(A)) : 89.3
L90 (dB(A)) : 64.9
Ldn (dB(A)) : 73.9
Standard (dB(A)) : 70

Reference Method : ISO1996-1 and 1996-2

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

Remark :

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Technical Management

Thanitak.

Thanita Kulsuriwong
Scientist (4)

Approved by

Supot S.

Supot Salamteh
Section Head

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Analysis / Test Report



TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108343

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2439007-1

Page 1 of 1

Sample Number 22108343-3
Parameter Noise (Leq 24 hrs.)
Location ครัวด้านทางเข้าโรงงาน (GPS 47P 0730813, 1405150)
Measurement Date Sep 07 - Sep 08, 2022
Measurement by Satcha Phetsawaeng
Sound Level meter Serial No. 900071

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	69.2	86.1	65.1
10:00 AM - 11:00 AM	68.8	90.0	65.0
11:00 AM - 12:00 PM	68.8	84.0	64.9
12:00 PM - 01:00 PM	68.6	85.0	64.9
01:00 PM - 02:00 PM	68.8	87.7	64.9
02:00 PM - 03:00 PM	68.5	86.4	64.9
03:00 PM - 04:00 PM	68.3	89.3	65.0
04:00 PM - 05:00 PM	67.4	85.3	64.1
05:00 PM - 06:00 PM	66.2	79.1	64.5
06:00 PM - 07:00 PM	68.6	86.3	64.9
07:00 PM - 08:00 PM	68.1	81.0	65.0
08:00 PM - 09:00 PM	67.4	81.5	65.3
09:00 PM - 10:00 PM	66.7	79.5	65.1
10:00 PM - 11:00 PM	67.2	83.3	65.5
11:00 PM - 12:00 AM	66.4	79.9	65.1
12:00 AM - 01:00 AM	65.9	78.9	65.0
01:00 AM - 02:00 AM	66.0	80.4	64.9
02:00 AM - 03:00 AM	66.0	80.5	65.0
03:00 AM - 04:00 AM	66.3	79.2	64.9
04:00 AM - 05:00 AM	66.4	78.4	64.9
05:00 AM - 06:00 AM	67.0	86.2	64.9
06:00 AM - 07:00 AM	68.3	84.1	64.7
07:00 AM - 08:00 AM	67.9	87.7	64.6
08:00 AM - 09:00 AM	69.1	85.8	64.6

Leq Average 24 hrs. (dB(A)) 67.7
Lmax (dB(A)) 90.0
L90 (dB(A)) 64.9
Ldn (dB(A)) 73.4
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

Thanitak.

Thanita Kulsuriwong
Scientist (4)

Approved by

Supot S.

Supot Salamteh
Section Head

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Analysis / Test Report



TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108343

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2439008-1

Page 1 of 1

Sample Number 22108343-4
Parameter Noise (Leq 24 hrs.)
Location ครัวด้านทางเข้าโรงงาน (GPS 47P 0730813, 1405150)
Measurement Date Sep 08 - Sep 09, 2022
Measurement by Satcha Phetsawaeng
Sound Level meter Serial No. 900071

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	68.0	86.2	64.8
10:00 AM - 11:00 AM	68.4	89.3	65.0
11:00 AM - 12:00 PM	68.4	85.2	65.0
12:00 PM - 01:00 PM	68.1	80.9	64.8
01:00 PM - 02:00 PM	68.3	86.7	64.9
02:00 PM - 03:00 PM	68.5	85.9	64.9
03:00 PM - 04:00 PM	68.2	86.0	64.8
04:00 PM - 05:00 PM	68.6	83.6	64.8
05:00 PM - 06:00 PM	68.9	88.5	64.8
06:00 PM - 07:00 PM	68.4	86.0	64.9
07:00 PM - 08:00 PM	67.8	85.9	64.8
08:00 PM - 09:00 PM	66.5	81.5	64.6
09:00 PM - 10:00 PM	66.4	83.9	64.6
10:00 PM - 11:00 PM	66.0	77.8	64.6
11:00 PM - 12:00 AM	65.9	88.5	64.6
12:00 AM - 01:00 AM	65.5	78.9	64.6
01:00 AM - 02:00 AM	65.5	76.7	64.7
02:00 AM - 03:00 AM	65.5	79.4	64.6
03:00 AM - 04:00 AM	65.6	79.6	64.6
04:00 AM - 05:00 AM	65.8	80.1	64.5
05:00 AM - 06:00 AM	67.0	87.5	64.7
06:00 AM - 07:00 AM	69.2	86.3	64.9
07:00 AM - 08:00 AM	65.7	77.3	64.3
08:00 AM - 09:00 AM	69.0	88.5	65.0

Leq Average 24 hrs. (dB(A)) 67.5
Lmax (dB(A)) 89.3
L90 (dB(A)) 64.8
Ldn (dB(A)) 73.1
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

Thanitak.

Thanita Kulsuriwong
Scientist (4)

Approved by

Supot S.

Supot Salamteh
Section Head

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S:\Reports_Air Noise.rpt (1:48PM)



Analysis / Test Report



TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108343

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2439009-1

Page 1 of 1

Sample Number 22108343-5
Parameter Noise (Leq 24 hrs.)
Location ครัวด้านทางเข้าโรงงาน (GPS 47P 0730813, 1405150)
Measurement Date Sep 09 - Sep 10, 2022
Measurement by Satcha Phetsawaeng
Sound Level meter Serial No. 900071

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	67.7	86.4	64.1
10:00 AM - 11:00 AM	68.0	86.3	64.4
11:00 AM - 12:00 PM	68.1	86.7	65.1
12:00 PM - 01:00 PM	68.6	87.8	65.0
01:00 PM - 02:00 PM	68.5	85.5	64.9
02:00 PM - 03:00 PM	68.2	85.0	64.5
03:00 PM - 04:00 PM	68.3	84.3	64.5
04:00 PM - 05:00 PM	68.7	84.8	64.8
05:00 PM - 06:00 PM	68.7	84.3	64.9
06:00 PM - 07:00 PM	68.8	87.6	64.8
07:00 PM - 08:00 PM	68.0	89.1	64.7
08:00 PM - 09:00 PM	66.1	82.4	64.5
09:00 PM - 10:00 PM	66.0	78.5	64.5
10:00 PM - 11:00 PM	65.9	79.1	64.4
11:00 PM - 12:00 AM	65.3	75.6	64.4
12:00 AM - 01:00 AM	65.3	79.7	64.4
01:00 AM - 02:00 AM	65.2	77.7	64.4
02:00 AM - 03:00 AM	65.4	80.1	64.5
03:00 AM - 04:00 AM	65.5	76.9	64.5
04:00 AM - 05:00 AM	65.6	80.4	64.4
05:00 AM - 06:00 AM	66.3	84.2	64.5
06:00 AM - 07:00 AM	69.0	88.1	64.9
07:00 AM - 08:00 AM	68.7	87.7	64.5
08:00 AM - 09:00 AM	67.7	87.3	64.6

Leq Average 24 hrs. (dB(A)) 67.4
Lmax (dB(A)) 89.1
L90 (dB(A)) 64.5
Ldn (dB(A)) 72.9
Standard (dB(A)) 70

Reference Method : ISO1996-1 and 1996-2

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

Remark :

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

Technical Management

Thanitak.

Thanita Kulsuriwong
Scientist (4)

Approved by

Supot S.

Supot Salamteh
Section Head

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Analysis / Test Report



TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108343

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2439010-1

Page 1 of 1

Sample Number 22108343-6
Parameter Noise (Leq 24 hrs.)
Location ครัวด้านทางเข้าโรงงาน (GPS 47P 0730813, 1405150)
Measurement Date Sep 10 - Sep 11, 2022
Measurement by Satcha Phetsawaeng
Sound Level meter Serial No. 900071

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	67.7	84.5	64.6
10:00 AM - 11:00 AM	68.0	84.8	64.8
11:00 AM - 12:00 PM	67.5	87.7	64.8
12:00 PM - 01:00 PM	67.6	87.7	64.7
01:00 PM - 02:00 PM	67.9	85.0	64.8
02:00 PM - 03:00 PM	67.5	84.8	64.6
03:00 PM - 04:00 PM	68.8	87.2	66.0
04:00 PM - 05:00 PM	68.7	85.5	66.0
05:00 PM - 06:00 PM	67.3	82.1	64.8
06:00 PM - 07:00 PM	67.9	84.8	64.8
07:00 PM - 08:00 PM	67.7	84.8	64.6
08:00 PM - 09:00 PM	66.0	80.7	64.6
09:00 PM - 10:00 PM	65.6	78.3	64.6
10:00 PM - 11:00 PM	65.6	80.4	64.5
11:00 PM - 12:00 AM	65.6	81.5	64.5
12:00 AM - 01:00 AM	65.3	77.9	64.6
01:00 AM - 02:00 AM	65.6	77.6	64.6
02:00 AM - 03:00 AM	65.4	78.9	64.5
03:00 AM - 04:00 AM	65.4	77.3	64.6
04:00 AM - 05:00 AM	65.6	79.9	64.7
05:00 AM - 06:00 AM	66.2	83.4	64.7
06:00 AM - 07:00 AM	68.6	91.8	64.8
07:00 AM - 08:00 AM	68.1	84.8	64.6
08:00 AM - 09:00 AM	67.9	91.1	64.5

Leq Average 24 hrs. (dB(A)) 67.1
Lmax (dB(A)) 91.8
L90 (dB(A)) 64.6
Ldn (dB(A)) 72.7
Standard (dB(A)) 70

Reference Method : ISO1996-1 and 1996-2

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

Remark :

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Technical Management

Thanitak.

Thanita Kulsuriwong
Scientist (4)

Approved by

Supot S.

Supot Salamteh
Section Head

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S:\Reports_Air Noise.rpt (1:48PM)



Analysis / Test Report



TESTING
No. 0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108343

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2439011-1

Page 1 of 1

Sample Number : 22108343-7
Parameter : Noise (Leq 24 hrs.)
Location : ครัวด้านทางเข้าโรงงาน (GPS 47P 0730813, 1405150)
Measurement Date : Sep 11 - Sep 12, 2022
Measurement by : Satcha Phetsawaeng
Sound Level meter : Serial No. 900071

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	68.2	95.1	64.9
10:00 AM - 11:00 AM	68.0	85.2	65.0
11:00 AM - 12:00 PM	67.9	94.5	64.7
12:00 PM - 01:00 PM	67.1	89.3	64.5
01:00 PM - 02:00 PM	67.0	82.8	64.2
02:00 PM - 03:00 PM	67.6	94.2	64.2
03:00 PM - 04:00 PM	67.1	89.2	64.7
04:00 PM - 05:00 PM	67.8	86.4	65.0
05:00 PM - 06:00 PM	66.4	80.7	64.6
06:00 PM - 07:00 PM	67.2	80.8	64.8
07:00 PM - 08:00 PM	67.4	87.6	64.9
08:00 PM - 09:00 PM	66.5	93.1	64.7
09:00 PM - 10:00 PM	65.9	81.4	64.7
10:00 PM - 11:00 PM	65.7	78.9	64.6
11:00 PM - 12:00 AM	66.5	79.4	64.7
12:00 AM - 01:00 AM	68.2	84.8	65.5
01:00 AM - 02:00 AM	67.9	91.4	66.7
02:00 AM - 03:00 AM	68.2	84.1	66.7
03:00 AM - 04:00 AM	67.9	83.8	66.4
04:00 AM - 05:00 AM	68.1	81.9	66.3
05:00 AM - 06:00 AM	68.4	85.6	65.8
06:00 AM - 07:00 AM	68.1	83.0	65.4
07:00 AM - 08:00 AM	67.6	87.0	65.4
08:00 AM - 09:00 AM	69.8	84.8	65.9

Leq Average 24 hrs. (dB(A)) : 67.6
Lmax (dB(A)) : 95.1
L90 (dB(A)) : 64.9
Ldn (dB(A)) : 74.1
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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P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437367-1

Page 1 of 1

Sample Number 22108282-1
Parameter Noise (Leq 8 hrs.)
Location เครื่องอัดอากาศ
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:30 AM - 10:30 AM	80.5	89.9	78.6
10:30 AM - 11:30 AM	80.4	87.4	78.6
11:30 AM - 12:30 PM	80.9	87.3	79.0
12:30 PM - 01:30 PM	81.8	88.0	78.7
01:30 PM - 02:30 PM	81.0	88.8	78.9
02:30 PM - 03:30 PM	81.0	88.2	79.2
03:30 PM - 04:30 PM	81.0	90.4	79.3
04:30 PM - 05:30 PM	80.6	86.7	78.7

Leq Average 8 hrs. (dB(A))

80.9

Lmax (dB(A))

90.4

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Technical Management

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437368-1

Page 1 of 1

Sample Number 22108282-2
Parameter Noise (Leq 8 hrs.)
Location พหลโยธิน
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:26 AM - 10:26 AM	69.9	80.4	69.0
10:26 AM - 11:26 AM	69.7	76.7	69.0
11:26 AM - 12:26 PM	69.5	75.4	68.9
12:26 PM - 01:26 PM	70.0	76.1	69.4
01:26 PM - 02:26 PM	70.1	75.6	69.6
02:26 PM - 03:26 PM	69.9	74.4	69.3
03:26 PM - 04:26 PM	70.1	76.6	69.5
04:26 PM - 05:26 PM	70.1	75.1	69.5

Leq Average 8 hrs. (dB(A))

69.9

Lmax (dB(A))

80.4

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437369-1

Page 1 of 1

Sample Number 22108282-3
Parameter Noise (Leq 8 hrs.)
Location เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #1
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:38 AM - 10:38 AM	75.8	79.6	75.3
10:38 AM - 11:38 AM	75.9	79.0	75.4
11:38 AM - 12:38 PM	76.3	81.8	75.8
12:38 PM - 01:38 PM	75.9	80.0	75.4
01:38 PM - 02:38 PM	76.1	78.6	75.6
02:38 PM - 03:38 PM	76.3	84.6	75.8
03:38 PM - 04:38 PM	76.2	80.3	75.7
04:38 PM - 05:38 PM	76.3	81.2	75.8

Leq Average 8 hrs. (dB(A))

76.1

Lmax (dB(A))

84.6

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437370-1

Page 1 of 1

Sample Number 22108282-4
Parameter Noise (Leq 8 hrs.)
Location เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #2
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:45 AM - 10:45 AM	81.2	82.9	80.9
10:45 AM - 11:45 AM	81.3	82.8	81.0
11:45 AM - 12:45 PM	81.5	85.1	81.2
12:45 PM - 01:45 PM	81.4	83.0	81.2
01:45 PM - 02:45 PM	81.5	83.7	81.3
02:45 PM - 03:45 PM	81.6	84.3	81.4
03:45 PM - 04:45 PM	81.6	83.8	81.4
04:45 PM - 05:45 PM	81.7	84.5	81.4

Leq Average 8 hrs. (dB(A))

81.5

Lmax (dB(A))

85.1

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437371-1

Page 1 of 1

Sample Number 22108282-5
Parameter Noise (Leq 8 hrs.)
Location เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #3
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:53 PM - 09:53 PM	81.2	82.2	80.9
09:53 PM - 10:53 PM	81.3	82.8	81.0
10:53 PM - 11:53 PM	81.2	82.5	81.0
11:53 PM - 12:53 AM	81.2	82.4	80.9
12:53 AM - 01:53 AM	81.4	82.4	81.1
01:53 AM - 02:53 AM	81.4	82.4	81.1
02:53 AM - 03:53 AM	81.3	82.8	80.9
03:53 AM - 04:53 AM	81.1	82.5	80.8

Leq Average 8 hrs. (dB(A))

81.3

Lmax (dB(A))

82.8

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

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Technical Management

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P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437372-1

Page 1 of 1

Sample Number 22108282-6
Parameter Noise (Leq 8 hrs.)
Location เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #4
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:32 AM - 10:32 AM	84.0	90.7	83.5
10:32 AM - 11:32 AM	84.2	86.8	83.8
11:32 AM - 12:32 PM	84.6	86.5	84.1
12:32 PM - 01:32 PM	84.3	86.7	83.8
01:32 PM - 02:32 PM	84.7	86.6	84.2
02:32 PM - 03:32 PM	84.9	87.4	84.4
03:32 PM - 04:32 PM	84.8	86.8	84.3
04:32 PM - 05:32 PM	84.6	87.4	84.1

Leq Average 8 hrs. (dB(A))

84.5

Lmax (dB(A))

90.7

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Technical Management

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P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437373-1

Page 1 of 1

Sample Number 22108282-7
Parameter Noise (Leq 8 hrs.)
Location เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #5
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:38 PM - 09:38 PM	84.2	87.2	83.1
09:38 PM - 10:38 PM	84.4	87.5	83.3
10:38 PM - 11:38 PM	84.2	87.5	83.3
11:38 PM - 12:38 AM	84.1	87.7	83.2
12:38 AM - 01:38 AM	84.1	87.3	83.2
01:38 AM - 02:38 AM	84.0	87.6	83.1
02:38 AM - 03:38 AM	83.6	86.6	82.9
03:38 AM - 04:38 AM	83.9	87.4	83.0

Leq Average 8 hrs. (dB(A))

84.1

Lmax (dB(A))

87.7

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Technical Management

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P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437374-1

Page 1 of 1

Sample Number 22108282-8
Parameter Noise (Leq 8 hrs.)
Location เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #6
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:03 PM - 10:03 PM	80.0	83.0	79.8
10:03 PM - 11:03 PM	80.1	81.7	79.9
11:03 PM - 12:03 AM	80.1	81.8	79.8
12:03 AM - 01:03 AM	80.2	81.8	79.8
01:03 AM - 02:03 AM	80.1	81.9	79.8
02:03 AM - 03:03 AM	80.0	81.7	79.7
03:03 AM - 04:03 AM	79.9	81.4	79.5
04:03 AM - 05:03 AM	79.8	81.3	79.6

Leq Average 8 hrs. (dB(A))

80.0

Lmax (dB(A))

83.0

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Technical Management

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P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437375-1

Page 1 of 1

Sample Number 22108282-9
Parameter Noise (Leq 8 hrs.)
Location หน่วยผลิตไอน้ำหลัก HRSG #1
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:32 AM - 10:32 AM	79.1	83.2	78.2
10:32 AM - 11:32 AM	78.5	80.9	77.7
11:32 AM - 12:32 PM	78.3	80.6	77.8
12:32 PM - 01:32 PM	78.4	80.7	77.7
01:32 PM - 02:32 PM	78.2	80.1	77.8
02:32 PM - 03:32 PM	78.6	80.8	78.1
03:32 PM - 04:32 PM	78.5	80.7	77.9
04:32 PM - 05:32 PM	78.5	80.8	78.0

Leq Average 8 hrs. (dB(A))

78.5

Lmax (dB(A))

83.2

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย
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S:\Reports\Air Noise.rpt (2:24PM)



Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150

P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437376-1

Page 1 of 1

Sample Number 22108282-10
Parameter Noise (Leq 8 hrs.)
Location หน่วยผลิตไอน้ำหลัก HRSG # 2
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:28 AM - 10:28 AM	81.6	84.1	81.3
10:28 AM - 11:28 AM	81.4	82.3	81.1
11:28 AM - 12:28 PM	81.5	82.5	81.2
12:28 PM - 01:28 PM	81.8	82.6	81.6
01:28 PM - 02:28 PM	81.8	82.6	81.6
02:28 PM - 03:28 PM	81.7	82.3	81.5
03:28 PM - 04:28 PM	81.8	82.7	81.6
04:28 PM - 05:28 PM	81.8	82.8	81.6

Leq Average 8 hrs. (dB(A))

81.7

Lmax (dB(A))

84.1

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย
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Technical Management

Thanitak.

Thanita Kulsuriwong
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Supot S.

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Section Head

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Analysis / Test Report

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P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437377-1

Page 1 of 1

Sample Number 22108282-11
Parameter Noise (Leq 8 hrs.)
Location หน่วยผลิตไอน้ำหลัก HRSG #3
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:40 PM - 09:40 PM	81.3	82.2	81.0
09:40 PM - 10:40 PM	81.0	81.9	80.8
10:40 PM - 11:40 PM	80.9	81.7	80.8
11:40 PM - 12:40 AM	80.9	81.8	80.7
12:40 AM - 01:40 AM	80.9	81.7	80.7
01:40 AM - 02:40 AM	80.9	81.8	80.7
02:40 AM - 03:40 AM	80.9	81.6	80.7
03:40 AM - 04:40 AM	81.1	81.9	80.9

Leq Average 8 hrs. (dB(A))

81.0

Lmax (dB(A))

82.2

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437378-1

Page 1 of 1

Sample Number 22108282-12
Parameter Noise (Leq 8 hrs.)
Location หน่วยผลิตไอน้ำหลัก HRSG #4
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:18 AM - 10:18 AM	79.1	87.9	78.8
10:18 AM - 11:18 AM	78.9	78.8	78.6
11:18 AM - 12:18 PM	78.8	79.6	78.7
12:18 PM - 01:18 PM	78.9	79.6	78.7
01:18 PM - 02:18 PM	78.9	79.7	78.7
02:18 PM - 03:18 PM	78.8	79.5	78.7
03:18 PM - 04:18 PM	78.9	79.6	78.7
04:18 PM - 05:18 PM	78.9	79.8	78.7

Leq Average 8 hrs. (dB(A))

78.9

Lmax (dB(A))

87.9

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437379-1

Page 1 of 1

Sample Number 22108282-13
Parameter Noise (Leq 8 hrs.)
Location หน่วยผลิตไอน้ำหลัก HRSG #5
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:16 PM - 10:16 PM	80.8	81.9	80.5
10:16 PM - 11:16 PM	80.7	81.9	80.5
11:16 PM - 12:16 AM	80.6	81.8	80.4
12:16 AM - 01:16 AM	80.6	81.8	80.4
01:16 AM - 02:16 AM	80.6	82.1	80.3
02:16 AM - 03:16 AM	80.5	82.0	80.2
03:16 AM - 04:16 AM	80.6	81.8	80.3
04:16 AM - 05:16 AM	81.3	87.0	80.4

Leq Average 8 hrs. (dB(A))

80.7

Lmax (dB(A))

87.0

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย
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P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437380-1

Page 1 of 1

Sample Number 22108282-14
Parameter Noise (Leq 8 hrs.)
Location หน่วยผลิตไอน้ำหลัก HRSG #6
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:04 PM - 10:04 PM	77.7	78.7	77.5
10:04 PM - 11:04 PM	77.8	78.7	77.5
11:04 PM - 12:04 AM	77.7	78.7	77.5
12:04 AM - 01:04 AM	77.6	78.3	77.3
01:04 AM - 02:04 AM	77.3	78.1	77.2
02:04 AM - 03:04 AM	77.3	78.4	77.1
03:04 AM - 04:04 AM	77.2	78.0	77.0
04:04 AM - 05:04 AM	77.5	78.2	77.3

Leq Average 8 hrs. (dB(A))

77.5

Lmax (dB(A))

78.7

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย
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P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108282

Date Received : Sep 14, 2022

Date Reported : Sep 20, 2022

Report Number: 2437381-1

Page 1 of 1

Sample Number 22108282-15
Parameter Noise (Leq 8 hrs.)
Location หน่วยผลิตไฟฟ้าสำรอง
Measurement Date Sep 13, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:59 PM - 10:59 PM	81.1	84.8	80.1
10:59 PM - 11:59 PM	81.1	84.7	80.1
11:59 PM - 12:59 AM	81.4	86.0	79.9
12:59 AM - 01:59 AM	81.5	85.8	79.9
01:59 AM - 02:59 AM	81.6	85.9	80.2
02:59 AM - 03:59 AM	81.5	86.2	79.7
03:59 AM - 04:59 AM	80.9	85.4	79.7
04:59 AM - 05:59 AM	81.2	92.2	80.0

Leq Average 8 hrs. (dB(A))

81.3

Lmax (dB(A))

92.2

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย
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P/O : DA41002956

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22132648

Date Received : Nov 15, 2022

Date Reported : Nov 21, 2022

Report Number: 2496802-1

Page 1 of 1

Sample Number 22132648-1
Parameter Noise (Leq 8 hrs.)
Location เครื่องอัดอากาศ
Measurement Date Nov 14, 2022
Measurement by Ronnachai Mounigma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:07 PM - 11:07 PM	79.6	85.3	78.5
11:07 PM - 12:07 AM	79.6	83.6	78.8
12:07 AM - 01:07 AM	80.0	83.9	78.9
01:07 AM - 02:07 AM	79.6	83.6	78.5
02:07 AM - 03:07 AM	79.4	83.1	78.4
03:07 AM - 04:07 AM	79.6	83.6	78.5
04:07 AM - 05:07 AM	79.9	83.8	78.6
05:07 AM - 06:07 AM	79.8	83.5	78.6

Leq Average 8 hrs. (dB(A))

79.7

Lmax (dB(A))

85.3

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย
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P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22132648
Date Received : Nov 15, 2022
Date Reported : Nov 21, 2022
Report Number: 2496803-1

Page 1 of 1

Sample Number 22132648-2
Parameter Noise (Leq 8 hrs.)
Location ทอหล่อเย็น
Measurement Date Nov 14, 2022
Measurement by Ronnachai Mounigma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:04 PM - 11:04 PM	69.7	74.3	69.4
11:04 PM - 12:04 AM	69.7	76.2	69.4
12:04 AM - 01:04 AM	69.6	73.9	69.4
01:04 AM - 02:04 AM	69.6	73.9	69.4
02:04 AM - 03:04 AM	69.5	74.2	69.3
03:04 AM - 04:04 AM	69.4	72.6	69.2
04:04 AM - 05:04 AM	69.5	73.6	69.3
05:04 AM - 06:04 AM	69.6	73.5	69.3

Leq Average 8 hrs. (dB(A)) 69.6
Lmax (dB(A)) 76.2
Standard (dB(A)) 90
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22132648
Date Received : Nov 15, 2022
Date Reported : Nov 21, 2022
Report Number: 2496804-1

Page 1 of 1

Sample Number 22132648-3
Parameter Noise (Leq 8 hrs.)
Location เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #1
Measurement Date Nov 14, 2022
Measurement by Ronnachai Mounigma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:01 AM - 10:01 AM	82.9	87.6	82.6
10:01 AM - 11:01 AM	82.9	84.5	82.5
11:01 AM - 12:01 PM	82.7	85.7	82.4
12:01 PM - 01:01 PM	82.8	88.8	82.5
01:01 PM - 02:01 PM	82.9	84.6	82.6
02:01 PM - 03:01 PM	83.0	84.7	82.7
03:01 PM - 04:01 PM	83.1	84.8	82.8
04:01 PM - 05:01 PM	83.0	86.2	82.7

Leq Average 8 hrs. (dB(A)) 82.9
Lmax (dB(A)) 88.8
Standard (dB(A)) 90
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22132648
Date Received : Nov 15, 2022
Date Reported : Nov 21, 2022
Report Number: 2496805-1

Page 1 of 1

Sample Number 22132648-4
Parameter Noise (Leq 8 hrs.)
Location เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #2
Measurement Date Nov 14, 2022
Measurement by Ronnachai MOUNGMA

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:02 AM - 10:02 AM	82.2	84.4	81.9
10:02 AM - 11:02 AM	82.3	84.5	82.0
11:02 AM - 12:02 PM	82.3	84.1	82.0
12:02 PM - 01:02 PM	82.4	87.5	82.2
01:02 PM - 02:02 PM	82.5	83.7	82.3
02:02 PM - 03:02 PM	82.6	84.5	82.3
03:02 PM - 04:02 PM	82.7	86.3	82.4
04:02 PM - 05:02 PM	82.9	85.1	82.7

Leq Average 8 hrs. (dB(A)) 82.5
Lmax (dB(A)) 87.5
Standard (dB(A)) 90
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Supot Salamteh
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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22132648
Date Received : Nov 15, 2022
Date Reported : Nov 21, 2022
Report Number: 2496806-1

Page 1 of 1

Sample Number 22132648-5
Parameter Noise (Leq 8 hrs.)
Location เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #3
Measurement Date Nov 14, 2022
Measurement by Ronnachai MOUNGMA

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:02 PM - 11:02 PM	82.3	85.4	81.6
11:02 PM - 12:02 AM	82.4	85.2	81.6
12:02 AM - 01:02 AM	82.3	84.9	81.4
01:02 AM - 02:02 AM	82.3	85.7	81.5
02:02 AM - 03:02 AM	81.3	84.9	80.3
03:02 AM - 04:02 AM	80.3	81.1	80.1
04:02 AM - 05:02 AM	80.3	81.1	80.2
05:02 AM - 06:02 AM	80.4	81.2	80.2

Leq Average 8 hrs. (dB(A)) 81.5
Lmax (dB(A)) 85.7
Standard (dB(A)) 90
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Technical Management

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Thanita Kulsuriwong
Scientist (4)

Approved by

Supot S.

Supot Salamteh
Section Head

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P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22132648
Date Received : Nov 15, 2022
Date Reported : Nov 21, 2022
Report Number: 2496808-1

Page 1 of 1

Sample Number 22132648-7
Parameter Noise (Leq 8 hrs.)
Location เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #5
Measurement Date Nov 14, 2022
Measurement by Ronnachai MOUNGMA

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:05 AM - 10:05 AM	82.9	85.2	82.3
10:05 AM - 11:05 AM	82.5	84.2	82.1
11:05 AM - 12:05 PM	82.5	84.0	82.2
12:05 PM - 01:05 PM	82.6	85.0	82.2
01:05 PM - 02:05 PM	82.7	84.4	82.5
02:05 PM - 03:05 PM	82.6	83.3	82.4
03:05 PM - 04:05 PM	82.7	83.4	82.5
04:05 PM - 05:05 PM	82.4	83.5	82.2

Leq Average 8 hrs. (dB(A)) 82.6
Lmax (dB(A)) 85.2
Standard (dB(A)) 90
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Analysis / Test Report

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P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22132648
Date Received : Nov 15, 2022
Date Reported : Nov 21, 2022
Report Number: 2496809-1

Page 1 of 1

Sample Number 22132648-8
Parameter Noise (Leq 8 hrs.)
Location เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #6
Measurement Date Nov 14, 2022
Measurement by Ronnachai MOUNGMA

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	81.5	84.3	81.1
10:00 AM - 11:00 AM	81.4	86.3	81.0
11:00 AM - 12:00 PM	81.3	86.3	80.9
12:00 PM - 01:00 PM	81.3	85.2	81.0
01:00 PM - 02:00 PM	81.3	84.3	81.0
02:00 PM - 03:00 PM	81.5	83.7	81.1
03:00 PM - 04:00 PM	81.5	90.5	81.1
04:00 PM - 05:00 PM	81.6	83.2	81.3

Leq Average 8 hrs. (dB(A)) 81.4
Lmax (dB(A)) 90.5
Standard (dB(A)) 90
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22132648
Date Received : Nov 15, 2022
Date Reported : Nov 21, 2022
Report Number: 2496810-1

Page 1 of 1

Sample Number 22132648-9
Parameter Noise (Leq 8 hrs.)
Location หน่วยผลิตไอน้ำหลัก HRSG #1
Measurement Date Nov 14, 2022
Measurement by Ronnachai Mounigma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:04 AM - 10:04 AM	78.7	80.4	78.5
10:04 AM - 11:04 AM	78.5	79.2	78.3
11:04 AM - 12:04 PM	78.5	79.2	78.3
12:04 PM - 01:04 PM	78.5	79.6	78.3
01:04 PM - 02:04 PM	78.7	80.0	78.4
02:04 PM - 03:04 PM	78.8	80.1	78.6
03:04 PM - 04:04 PM	79.1	80.2	78.6
04:04 PM - 05:04 PM	79.2	79.8	79.0

Leq Average 8 hrs. (dB(A)) 78.8
Lmax (dB(A)) 80.4
Standard (dB(A)) 90
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย
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P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22132648
Date Received : Nov 15, 2022
Date Reported : Nov 21, 2022
Report Number: 2496811-1

Page 1 of 1

Sample Number 22132648-10
Parameter Noise (Leq 8 hrs.)
Location หน่วยผลิตไอน้ำหลัก HRSG #2
Measurement Date Nov 14, 2022
Measurement by Ronnachai Mounigma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:06 AM - 10:06 AM	78.5	80.2	78.3
10:06 AM - 11:06 AM	78.3	79.0	78.1
11:06 AM - 12:06 PM	78.3	79.0	78.1
12:06 PM - 01:06 PM	78.3	79.4	78.1
01:06 PM - 02:06 PM	78.5	79.8	78.2
02:06 PM - 03:06 PM	78.6	79.9	78.4
03:06 PM - 04:06 PM	78.9	80.0	78.4
04:06 PM - 05:06 PM	79.0	79.6	78.8

Leq Average 8 hrs. (dB(A)) 78.6
Lmax (dB(A)) 80.2
Standard (dB(A)) 90
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย
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P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22132648
Date Received : Nov 15, 2022
Date Reported : Nov 21, 2022
Report Number: 2496812-1

Page 1 of 1

Sample Number 22132648-11
Parameter Noise (Leq 8 hrs.)
Location หน่วยผลิตไอน้ำหลัก HRSG #3
Measurement Date Nov 14, 2022
Measurement by Ronnachai Mounigma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 PM - 11:00 PM	79.5	80.6	79.2
11:00 PM - 12:00 AM	79.7	80.9	79.4
12:00 AM - 01:00 AM	79.6	80.9	79.3
01:00 AM - 02:00 AM	79.7	81.0	79.4
02:00 AM - 03:00 AM	79.6	81.0	79.1
03:00 AM - 04:00 AM	79.4	80.9	78.9
04:00 AM - 05:00 AM	79.3	80.9	78.9
05:00 AM - 06:00 AM	79.4	80.6	79.0

Leq Average 8 hrs. (dB(A)) 79.5
Lmax (dB(A)) 81.0
Standard (dB(A)) 90
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย
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P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22132648
Date Received : Nov 15, 2022
Date Reported : Nov 21, 2022
Report Number: 2496814-1

Page 1 of 1

Sample Number 22132648-13
Parameter Noise (Leq 8 hrs.)
Location หน่วยผลิตไอน้ำหลัก HRSG #5
Measurement Date Nov 14, 2022
Measurement by Ronnachai Mounigma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:09 AM - 10:09 AM	76.1	81.5	75.7
10:09 AM - 11:09 AM	76.1	78.7	76.0
11:09 AM - 12:09 PM	76.1	78.7	76.0
12:09 PM - 01:09 PM	76.2	83.5	76.0
01:09 PM - 02:09 PM	76.3	79.7	76.1
02:09 PM - 03:09 PM	76.5	81.2	76.3
03:09 PM - 04:09 PM	76.6	85.2	76.3
04:09 PM - 05:09 PM	76.6	78.8	76.4

Leq Average 8 hrs. (dB(A)) 76.3
Lmax (dB(A)) 85.2
Standard (dB(A)) 90
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย
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Technical Management

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92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22132648
Date Received : Nov 15, 2022
Date Reported : Nov 21, 2022
Report Number: 2496815-1

Page 1 of 1

Sample Number 22132648-14
Parameter Noise (Leq 8 hrs.)
Location หน่วยผลิตไอน้ำหลัก HRSG #6
Measurement Date Nov 14, 2022
Measurement by Ronnachai Mounigma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:03 AM - 10:03 AM	79.8	89.8	79.6
10:03 AM - 11:03 AM	79.8	81.1	79.5
11:03 AM - 12:03 PM	79.8	80.9	79.5
12:03 PM - 01:03 PM	79.9	80.9	79.6
01:03 PM - 02:03 PM	79.9	81.1	79.7
02:03 PM - 03:03 PM	80.1	81.0	79.9
03:03 PM - 04:03 PM	80.0	81.0	79.7
04:03 PM - 05:03 PM	80.1	81.1	79.8

Leq Average 8 hrs. (dB(A)) 79.9
Lmax (dB(A)) 89.8
Standard (dB(A)) 90
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22141003
Date Received : Dec 23, 2022
Date Reported : Dec 26, 2022
Report Number: 2529929-1

Page 1 of 1

Sample Number 22141003-1
Parameter Noise (Leq 8 hrs.)
Location เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #4
Measurement Date Dec 22, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:11 AM - 10:11 AM	82.2	85.4	81.3
10:11 AM - 11:11 AM	81.8	84.2	81.1
11:11 AM - 12:11 PM	81.5	84.1	80.9
12:11 PM - 01:11 PM	81.4	84.3	80.8
01:11 PM - 02:11 PM	81.5	83.4	81.0
02:11 PM - 03:11 PM	81.5	84.8	80.9
03:11 PM - 04:11 PM	81.6	84.1	81.1
04:11 PM - 05:11 PM	81.6	84.0	81.1

Leq Average 8 hrs. (dB(A)) 81.6
Lmax (dB(A)) 85.4
Standard (dB(A)) 90
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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P/O : DA41002956

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22141003

Date Received : Dec 23, 2022

Date Reported : Dec 26, 2022

Report Number: 2529930-1

Page 1 of 1

Sample Number 22141003-2
Parameter Noise (Leq 8 hrs.)
Location หน่วยผลิตไอน้ำหลัก HRSG #4
Measurement Date Dec 22, 2022
Measurement by Tarin Octjinda

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:09 AM - 10:09 AM	79.6	81.2	79.3
10:09 AM - 11:09 AM	79.5	80.7	79.2
11:09 AM - 12:09 PM	79.4	80.7	79.1
12:09 PM - 01:09 PM	79.5	81.3	79.1
01:09 PM - 02:09 PM	79.7	80.8	79.4
02:09 PM - 03:09 PM	79.8	80.8	79.5
03:09 PM - 04:09 PM	79.9	81.2	79.6
04:09 PM - 05:09 PM	80.0	80.8	79.7

Leq Average 8 hrs. (dB(A))

79.7

Lmax (dB(A))

81.3

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

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92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand
21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108290
Date Received : Oct 12, 2022
Date Reported : Oct 17, 2022
Report Number: 2421061-1

Page 1 of 13

Sample Number	22108290-1				
Parameter	Heat Stress (Sampling Time : 09.00 AM - 11.00 AM)				
Measurement Date	Oct 12, 2022				
Measurement by	Supot Salamteh				
Location	ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)				
Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #1	120	29.0	25.6	36.8	33.7
Average (WBGT)		29.0			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Technical Management

Supot S
Supot Salamteh
Section Head

Approved by

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Wichan Choonharat
Assistant Manager

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Analysis / Test Report

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21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108290
Date Received : Oct 12, 2022
Date Reported : Oct 17, 2022
Report Number: 2421061-1

Page 2 of 13

Sample Number	22108290-2				
Parameter	Heat Stress (Sampling Time : 11.00 AM - 01.00 PM)				
Measurement Date	Oct 12, 2022				
Measurement by	Supot Salamteh				
Location	ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)				
Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #2	120	28.9	25.1	37.6	34.2
Average (WBGT)		28.9			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Technical Management

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Analysis / Test Report

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21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108290
Date Received : Oct 12, 2022
Date Reported : Oct 17, 2022
Report Number: 2421061-1

Page 3 of 13

Sample Number 22108290-3
Parameter Heat Stress (Sampling Time : 09.00 AM - 11.00 AM)
Measurement Date Oct 12, 2022
Measurement by Supot Salamteh
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #3	120	27.9	25.1	34.4	32.7
Average (WBGT)		27.9			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
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Technical Management

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21150

P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108290
Date Received : Oct 12, 2022
Date Reported : Oct 17, 2022
Report Number: 2421061-1

Page 4 of 13

Sample Number 22108290-4
Parameter Heat Stress (Sampling Time : 11.00 AM - 01.00 PM)
Measurement Date Oct 12, 2022
Measurement by Supot Salamteh
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #4	120	27.9	25.2	34.3	32.9
Average (WBGT)		27.9			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Technical Management

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P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108290
Date Received : Oct 12, 2022
Date Reported : Oct 17, 2022
Report Number: 2421061-1

Page 5 of 13

Sample Number	22108290-5				
Parameter	Heat Stress (Sampling Time : 09.00 AM - 11.00 AM)				
Measurement Date	Oct 12, 2022				
Measurement by	Supot Salamteh				
Location	ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)				
Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #5	120	27.8	25.1	34.1	32.5
Average (WBGT)		27.8			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
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Technical Management

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P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108290
Date Received : Oct 12, 2022
Date Reported : Oct 17, 2022
Report Number: 2421061-1

Page 6 of 13

Sample Number	22108290-6				
Parameter	Heat Stress (Sampling Time : 11.00 AM - 01.00 PM)				
Measurement Date	Oct 12, 2022				
Measurement by	Supot Salamteh				
Location	ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)				
Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
เครื่องกำเนิดไฟฟ้ากังหันก๊าซ #6	120	27.4	24.8	33.6	32.6
Average (WBGT)		27.4			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
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Technical Management

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P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108290
Date Received : Oct 12, 2022
Date Reported : Oct 17, 2022
Report Number: 2421061-1

Page 7 of 13

Sample Number 22108290-7
Parameter Heat Stress (Sampling Time : 09.00 AM - 11.00 AM)
Measurement Date Oct 12, 2022
Measurement by Supot Salamteh
Location ปรังุบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หน่วยผลิตไฟฟ้าหลัก HRSG #1	120	28.9	26.1	35.4	35.4
Average (WBGT)		28.9			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
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Technical Management

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P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108290
Date Received : Oct 12, 2022
Date Reported : Oct 17, 2022
Report Number: 2421061-1

Page 8 of 13

Sample Number 22108290-8
Parameter Heat Stress (Sampling Time : 11.00 AM - 01.00 PM)
Measurement Date Oct 12, 2022
Measurement by Supot Salamteh
Location ปรังุบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หน่วยผลิตไฟฟ้าหลัก HRSG #2	120	28.6	25.7	35.6	34.7
Average (WBGT)		28.6			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
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Technical Management

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P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108290
Date Received : Oct 12, 2022
Date Reported : Oct 17, 2022
Report Number: 2421061-1

Page 9 of 13

Sample Number	22108290-9				
Parameter	Heat Stress (Sampling Time : 09.00 AM - 11.00 AM)				
Measurement Date	Oct 12, 2022				
Measurement by	Supot Salamteh				
Location	ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)				
Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หน่วยผลิตไอน้ำหลัก HRSG #3	120	29.2	26.5	36.4	34.1
Average (WBGT)		29.2			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
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Technical Management

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Supot Salamteh
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P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108290
Date Received : Oct 12, 2022
Date Reported : Oct 17, 2022
Report Number: 2421061-1

Page 10 of 13

Sample Number	22108290-10				
Parameter	Heat Stress (Sampling Time : 11.00 AM - 01.00 PM)				
Measurement Date	Oct 12, 2022				
Measurement by	Supot Salamteh				
Location	ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)				
Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หน่วยผลิตไอน้ำหลัก HRSG #4	120	29.5	26.7	36.8	34.3
Average (WBGT)		29.5			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
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P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108290
Date Received : Oct 12, 2022
Date Reported : Oct 17, 2022
Report Number: 2421061-1

Page 11 of 13

Sample Number	22108290-11				
Parameter	Heat Stress (Sampling Time : 09.00 AM - 11.00 AM)				
Measurement Date	Oct 12, 2022				
Measurement by	Supot Salamteh				
Location	ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)				
Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หน่วยผลิตไฟฟ้าหลัก HRSG #5	120	29.5	26.8	36.5	34.2
Average (WBGT)		29.5			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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P/O :
Project Name : Monitoring
Project Location : CUP 1

Lot ID: 22108290
Date Received : Oct 12, 2022
Date Reported : Oct 17, 2022
Report Number: 2421061-1

Page 12 of 13

Sample Number	22108290-12				
Parameter	Heat Stress (Sampling Time : 11.00 AM - 01.00 PM)				
Measurement Date	Oct 12, 2022				
Measurement by	Supot Salamteh				
Location	ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)				
Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หน่วยผลิตไอน้ำหลัก HRSG #6	120	29.2	25.5	38.2	37.0
Average (WBGT)		29.2			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Technical Management

Supot S
Supot Salamteh
Section Head

Approved by

Wichan Ch
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand
21150

P/O :

Project Name : Monitoring

Project Location : CUP 1

Lot ID: 22108290

Date Received : Oct 12, 2022

Date Reported : Oct 17, 2022

Report Number: 2421061-1

Page 13 of 13

Sample Number 22108290-13
Parameter Heat Stress (Sampling Time : 11.00 AM - 01.00 PM)
Measurement Date Oct 12, 2022
Measurement by Supot Salamteh
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หน่วยผลิตน้ำประปา	120	31.0	26.6	42.8	37.7
Average (WBGT)		31.0			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Technical Management

Supot Salamteh
Section Head

Approved by

Wichan Choonharat
Assistant Manager

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Analysis / Test Report

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92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 1



TESTING
No.0042

Lot ID: 2284070
Date Received : Jul 12, 2022
Date Reported : Jul 20, 2022
Report Number : 2368529-1

Page 1 of 1

Sample Number	2284070-1						
Sampled Date	Jul 12, 2022 10:35 AM						
Sample Description	Wastewater						
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ						
Date Analysis Commenced	Jul 12, 2022						
Condition of Sample	Contained in one amber glass bottle and two 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	≤500	APHA (2017), 5210 B	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.7	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	32.1	≤45	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	416	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	16	≤200	APHA (2017), 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant

Sampled By : Chainusorn Lertnanthakunchai

Remark :

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

N. Bangmit

Narumon Banchongkit
Supervisor
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Approved by

D. Changchon

Dej Changchon
Senior Manager
ทะเบียนเลขที่ ๖-323-๖-9442

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P/O :
Project Name : Monitoring
Project Location : CUP 1



TESTING
No.0042

Lot ID: 2284071
Date Received : Aug 09, 2022
Date Reported : Aug 16, 2022
Report Number : 2368530-1

Page 1 of 1

Sample Number	2284071-1						
Sampled Date	Aug 09, 2022 11:10 AM						
Sample Description	Wastewater						
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ						
Date Analysis Commenced	Aug 09, 2022						
Condition of Sample	Contained in one amber glass bottle and two 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	≤500	APHA (2017), 5210 B	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	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	-	-	30.7	≤45	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	296	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	9	≤200	APHA (2017), 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant

Sampled By : Paramet Sattayakun

Remark :

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Technical Management

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Supervisor
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Approved by

D. Changchon

Dej Changchon
Senior Manager
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Analysis / Test Report

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P/O :
Project Name : Monitoring
Project Location : CUP 1



TESTING
No.0042

Lot ID: 2297321
Date Received : Sep 13, 2022
Date Reported : Sep 20, 2022
Report Number : 2398958-1

Page 1 of 1

Sample Number	2297321-1						
Sampled Date	Sep 13, 2022 10:05 AM						
Sample Description	Wastewater						
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ						
Date Analysis Commenced	Sep 13, 2022						
Condition of Sample	Contained in one amber glass bottle and two 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	≤500	APHA (2017), 5210 B	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	8.0	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	30.6	≤45	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	384	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	18	≤200	APHA (2017), 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant

Sampled By : Chainusorn Lertnanthakunchai

Remark :

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Technical Management

N. Bangmit

Narumon Banchongkit
Supervisor

ทะเบียนเลขที่ ๖-323-๖-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager

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Analysis / Test Report

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P/O :
Project Name : Monitoring
Project Location : CUP 1



TESTING
No.0042

Lot ID: 22120415
Date Received : Oct 11, 2022
Date Reported : Oct 19, 2022
Report Number : 2449898-1

Page 1 of 1

Sample Number	22120415-1						
Sampled Date	Oct 11, 2022 10:40 AM						
Sample Description	Wastewater						
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ						
Date Analysis Commenced	Oct 11, 2022						
Condition of Sample	Contained in one amber glass bottle and two 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	≤500	APHA (2017), 5210 B	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	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	-	-	29.5	≤45	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	214	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	7	≤200	APHA (2017), 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant

Sampled By : Chainusorn Lertnanthakunchai

Remark :

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Technical Management

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Narumon Banchongkit
Supervisor

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Approved by

D. Changchon

Dej Changchon
Senior Manager

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P/O :
Project Name : Monitoring
Project Location : CUP 1



TESTING
No.0042

Lot ID: 22123839
Date Received : Nov 08, 2022
Date Reported : Nov 14, 2022
Report Number : 2457519-1

Page 1 of 1

Sample Number	22123839-1						
Sampled Date	Nov 08, 2022 11:00 AM						
Sample Description	Wastewater						
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ						
Date Analysis Commenced	Nov 08, 2022						
Condition of Sample	Contained in one amber glass bottle and two 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	≤500	APHA (2017), 5210 B	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.6	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	31.3	≤45	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	250	≤3000	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	11	≤200	APHA (2017), 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant

Sampled By : Chainusorn Lertnanthakunchai

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Technical Management

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Approved by

D. Chuan

Dej Changchon
Senior Manager
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Analysis / Test Report

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P/O : DA41002956
Project Name : Monitoring
Project Location : CUP 1



TESTING
No.0042

Lot ID: 22139273
Date Received : Dec 13, 2022
Date Reported : Dec 20, 2022
Report Number : 2493726-1

Page 1 of 1

Sample Number	22139273-1						
Sampled Date	Dec 13, 2022 11:10 AM						
Sample Description	Wastewater						
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ						
Date Analysis Commenced	Dec 13, 2022						
Condition of Sample	Contained in one amber glass bottle and two 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	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
Oil & Grease *	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	7.5	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	30.2	≤45	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	206	≤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	7	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.76, B.E. 2560 : Criteria of wastewater characteristic from factory discharge to central wastewater Treatment Plant

Sampled By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ๖-323-๖-9461

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Technical Management

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Approved by

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Dej Changchon
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EMISSION TEST RESULT

Client	Global Power Supply PCL	Run #	1
Date	07 Sep 22	Location	HRSQ #1
Start Time	10:00	Test Operator	Salim P.
SO ₂ Analyzer Model	TELEDYNE API 100SH	Finish Time	10:30
NO _x Analyzer Model	TELEDYNE API 200SH	Serial No.	282
CO/CO ₂ Analyzer Model	TELEDYNE API 300SH	Serial No.	300

Time (min)	O ₂ (%)	CO ₂ (%)	NOx (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
10:02	13.02	4.42	11.20	4.80	4.80	
10:03	13.03	4.43	11.21	4.79	4.79	
10:04	13.04	4.44	11.22	4.78	4.78	
10:05	13.05	4.45	11.23	4.77	4.77	
10:06	13.06	4.46	11.24	4.76	4.76	
10:07	13.07	4.47	11.25	4.75	4.75	
10:08	13.08	4.48	11.26	4.74	4.74	
10:09	13.09	4.49	11.27	4.73	4.73	
10:10	13.10	4.50	11.28	4.72	4.72	
10:11	13.11	4.51	11.29	4.71	4.71	
10:12	13.12	4.52	11.30	4.70	4.70	
10:13	13.13	4.53	11.31	4.69	4.69	
10:14	13.14	4.54	11.32	4.68	4.68	
10:15	13.15	4.55	11.33	4.67	4.67	
10:16	13.16	4.56	11.34	4.66	4.66	
10:17	13.17	4.57	11.35	4.65	4.65	
10:18	13.18	4.58	11.36	4.64	4.64	
10:19	13.19	4.59	11.37	4.63	4.63	
10:20	13.20	4.60	11.38	4.62	4.62	
10:21	13.21	4.61	11.39	4.61	4.61	
10:22	13.22	4.62	11.40	4.60	4.60	
10:23	13.23	4.63	11.41	4.59	4.59	
10:24	13.24	4.64	11.42	4.58	4.58	
10:25	13.25	4.65	11.43	4.57	4.57	
10:26	13.26	4.66	11.44	4.56	4.56	
10:27	13.27	4.67	11.45	4.55	4.55	
10:28	13.28	4.68	11.46	4.54	4.54	
10:29	13.29	4.69	11.47	4.53	4.53	
10:30	13.30	4.70	11.48	4.52	4.52	
10:31	13.31	4.71	11.49	4.51	4.51	
10:32	13.32	4.72	11.50	4.50	4.50	
10:33	13.33	4.73	11.51	4.49	4.49	
10:34	13.34	4.74	11.52	4.48	4.48	
10:35	13.35	4.75	11.53	4.47	4.47	
10:36	13.36	4.76	11.54	4.46	4.46	
10:37	13.37	4.77	11.55	4.45	4.45	
10:38	13.38	4.78	11.56	4.44	4.44	
10:39	13.39	4.79	11.57	4.43	4.43	
10:40	13.40	4.80	11.58	4.42	4.42	
10:41	13.41	4.81	11.59	4.41	4.41	
10:42	13.42	4.82	11.60	4.40	4.40	
10:43	13.43	4.83	11.61	4.39	4.39	
10:44	13.44	4.84	11.62	4.38	4.38	
10:45	13.45	4.85	11.63	4.37	4.37	
10:46	13.46	4.86	11.64	4.36	4.36	
10:47	13.47	4.87	11.65	4.35	4.35	
10:48	13.48	4.88	11.66	4.34	4.34	
10:49	13.49	4.89	11.67	4.33	4.33	
10:50	13.50	4.90	11.68	4.32	4.32	
10:51	13.51	4.91	11.69	4.31	4.31	
10:52	13.52	4.92	11.70	4.30	4.30	
10:53	13.53	4.93	11.71	4.29	4.29	
10:54	13.54	4.94	11.72	4.28	4.28	
10:55	13.55	4.95	11.73	4.27	4.27	
10:56	13.56	4.96	11.74	4.26	4.26	
10:57	13.57	4.97	11.75	4.25	4.25	
10:58	13.58	4.98	11.76	4.24	4.24	
10:59	13.59	4.99	11.77	4.23	4.23	
11:00	13.60	5.00	11.78	4.22	4.22	
11:01	13.61	5.01	11.79	4.21	4.21	
11:02	13.62	5.02	11.80	4.20	4.20	
11:03	13.63	5.03	11.81	4.19	4.19	
11:04	13.64	5.04	11.82	4.18	4.18	
11:05	13.65	5.05	11.83	4.17	4.17	
11:06	13.66	5.06	11.84	4.16	4.16	
11:07	13.67	5.07	11.85	4.15	4.15	
11:08	13.68	5.08	11.86	4.14	4.14	
11:09	13.69	5.09	11.87	4.13	4.13	
11:10	13.70	5.10	11.88	4.12	4.12	
11:11	13.71	5.11	11.89	4.11	4.11	
11:12	13.72	5.12	11.90	4.10	4.10	
11:13	13.73	5.13	11.91	4.09	4.09	
11:14	13.74	5.14	11.92	4.08	4.08	
11:15	13.75	5.15	11.93	4.07	4.07	
11:16	13.76	5.16	11.94	4.06	4.06	
11:17	13.77	5.17	11.95	4.05	4.05	
11:18	13.78	5.18	11.96	4.04	4.04	
11:19	13.79	5.19	11.97	4.03	4.03	
11:20	13.80	5.20	11.98	4.02	4.02	
11:21	13.81	5.21	11.99	4.01	4.01	
11:22	13.82	5.22	12.00	4.00	4.00	
11:23	13.83	5.23	12.01	3.99	3.99	
11:24	13.84	5.24	12.02	3.98	3.98	
11:25	13.85	5.25	12.03	3.97	3.97	
11:26	13.86	5.26	12.04	3.96	3.96	
11:27	13.87	5.27	12.05	3.95	3.95	
11:28	13.88	5.28	12.06	3.94	3.94	
11:29	13.89	5.29	12.07	3.93	3.93	
11:30	13.90	5.30	12.08	3.92	3.92	
11:31	13.91	5.31	12.09	3.91	3.91	
11:32	13.92	5.32	12.10	3.90	3.90	
11:33	13.93	5.33	12.11	3.89	3.89	
11:34	13.94	5.34	12.12	3.88	3.88	
11:35	13.95	5.35	12.13	3.87	3.87	
11:36	13.96	5.36	12.14	3.86	3.86	
11:37	13.97	5.37	12.15	3.85	3.85	
11:38	13.98	5.38	12.16	3.84	3.84	
11:39	13.99	5.39	12.17	3.83	3.83	
11:40	14.00	5.40	12.18	3.82	3.82	
11:41	14.01	5.41	12.19	3.81	3.81	
11:42	14.02	5.42	12.20	3.80	3.80	
11:43	14.03	5.43	12.21	3.79	3.79	
11:44	14.04	5.44	12.22	3.78	3.78	
11:45	14.05	5.45	12.23	3.77	3.77	
11:46	14.06	5.46	12.24	3.76	3.76	
11:47	14.07	5.47	12.25	3.75	3.75	
11:48	14.08	5.48	12.26	3.74	3.74	
11:49	14.09	5.49	12.27	3.73	3.73	
11:50	14.10	5.50	12.28	3.72	3.72	
11:51	14.11	5.51	12.29	3.71	3.71	
11:52	14.12	5.52	12.30	3.70	3.70	
11:53	14.13	5.53	12.31	3.69	3.69	
11:54	14.14	5.54	12.32	3.68	3.68	
11:55	14.15	5.55	12.33	3.67	3.67	
11:56	14.16	5.56	12.34	3.66	3.66	
11:57	14.17	5.57	12.35	3.65	3.65	
11:58	14.18	5.58	12.36	3.64	3.64	
11:59	14.19	5.59	12.37	3.63	3.63	
12:00	14.20	5.60	12.38	3.62	3.62	
12:01	14.21	5.61	12.39	3.61	3.61	
12:02	14.22	5.62	12.40	3.60	3.60	
12:03	14.23	5.63	12.41	3.59	3.59	
12:04	14.24	5.64	12.42	3.58	3.58	
12:05	14.25	5.65	12.43	3.57	3.57	
12:06	14.26	5.66	12.44	3.56	3.56	
12:07	14.27	5.67	12.45	3.55	3.55	
12:08	14.28	5.68	12.46	3.54	3.54	
12:09	14.29	5.69	12.47	3.53	3.53	
12:10	14.30	5.70	12.48	3.52	3.52	
12:11	14.31	5.71	12.49	3.51	3.51	
12:12	14.32	5.72	12.50	3.50	3.50	
12:13	14.33	5.73	12.51	3.49	3.49	
12:14	14.34	5.74	12.52	3.48	3.48	
12:15	14.35	5.75	12.53	3.47	3.47	
12:16	14.36	5.76	12.54	3.46	3.46	
12:17	14.37	5.77	12.55	3.45	3.45	
12:18	14.38	5.78	12.56	3.44	3.44	
12:19	14.39	5.79	12.57	3.43	3.43	
12:20	14.40	5.80	12.58	3.42	3.42	
12:21	14.41	5.81	12.59	3.41	3.41	
12:22	14.42	5.82	12.60	3.40	3.40	
12:23	14.43	5.83	12.61	3.39	3.39	
12:24	14.44	5.84	12.62	3.38	3.38	
12:25	14.45	5.85	12.63	3.37	3.37	
12:26	14.46	5.86	12.64	3.36	3.36	
12:27	14.47	5.87	12.65	3.35	3.35	
12:28	14.48	5.88	12.66	3.34	3.34	
12:29	14.49	5.89	12.67	3.33	3.33	
12:30	14.50	5.90	12.68	3.32	3.32	
12:31	14.51	5.91	12.69	3.31	3.31	
12:32	14.52	5.92	12.70	3.30	3.30	
12:33	14.53	5.93	12.71	3.29	3.29	
12:34	14.54	5.94	12.72	3.28	3.28	
12:35	14.55	5.95	12.73	3.27	3.27	
12:36	14.56	5.96	12.74	3.26	3.26	
12:37	14.57	5.97	12.75	3.25	3.25	
12:38	14.58	5.98	12.76	3.24	3.24	
12:39	14.59	5.99	12.77	3.23	3.23	
12:40	14.60	6.00	12.78	3.22	3.22	
12:41	14.61	6.01	12.79	3.21	3.21	
12:42	14.62	6.02	12.80	3.20	3.20	
12:43	14.63	6.03	12.81	3.19	3.19	
12:44	14.64	6.04	12.82	3.18	3.18	
12:45	14.65	6.05	12.83	3.17	3.17	
12:46	14.66	6.06	12.84	3.16	3.16	
12:47	14.67	6.07	12.85	3.15	3.15	
12:48	14.68	6.08	12.86	3.14	3.14	
12:49	14.69	6.09	12.87	3.13	3.13	
12:50	14.70	6.10	12.88	3.12	3.12	
12:51	14.71	6.11	12.89	3.11	3.11	
12:52	14.72	6.12	12.90	3.10	3.10	
12:53	14.73	6.13	12.91	3.09	3.09	
12:54	14.74	6.14	12.92	3.08	3.08	
12:55	14.75	6.15	12.93	3.07	3.07	
12:56	14.76	6.16	12.94	3.06	3.06	
12:57	14.77	6.17	12.95	3.05	3.05	
12:58	14.78	6.18	12.96	3.04	3.04	
12:59	14.79	6.19	12.97	3.03	3.03	
13:00	14.80	6.20	12.98	3.02	3.02	
13:01	14.81	6.21	12.99	3.01	3.01	
13:02	14.82	6.22	13.00	3.00	3.00	
13:03	14.83	6.23	13.01	2.99	2.99	
13:04	14.84	6.24	13.02	2.98	2.98	
13:05	14.85	6.25	13.03	2.97	2.97	
13:06	14.86	6.26	13.04	2.96	2.96	
13:07	14.87	6.27	13.05	2.95	2.95	
13:08	14.88	6.28	13.06	2.94	2.94	
13:09	14.89	6.29	13.07	2.93	2.93	
13:10	14.90	6.30	13.08	2.92	2.92	

CERTIFICATE OF ANALYSIS

<p>Customer (Print) ALS Laboratory Group (Thailand)</p>	<p>Production Order Number: 90157309 Material Number: 557209-0-44 Case collection Date: 26-sep-2015 Expiry Date: 26-Sep-2014</p>
<p>Cylinder Description: STYL 02 K</p> <p>The measurement of this reference material is traceable to SI through the use of the Standard Gas from the gas flow rate measurement. The Certificate of Gas (Calibration Issued) was prepared by ISO-Certified. The reported uncertainty is based on a standard uncertainty approximately 0.5%.</p>	<p>The reference standard which is traceable to these National Standards of the BIPM is Equiva Quality Primary (EQA) No. 15.12 for the trace and the sample are prepared for a homogeneous base, without effective multiplied by average factor 0.5, providing a total of confidence of</p>
<p>Certificate Number: 285716</p>	<p>Analysis:</p>
<p>Cylinder Number: 36375</p>	<p><i>THAI</i></p>
<p>Nominal Cylinder Content: 6.540 36°</p>	<p>Apprves:</p>
<p>Nominal Pressure: 140 Bar</p>	<p><i>Joe</i></p>
<p>Yellow Color: CGA 590 BLACK</p>	<p>To Be Order Please Quote: 557209-0-44</p>
<p>Comments:</p> <ul style="list-style-type: none"> It is recommended that this product be used before 75% of actual contents are obtained and the stated value (in gas pressure is before 150psi) Other impurities due direct by analytical method of this product be report if it is more than 1% of minimum value component Keep out air is well contained and secure area. 	<p>JUCKYIA BAHU THAI</p>

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ROTA METER CALIBRATION RESULT JULY 2022

Rotameter ID	Calibration Date	Regression Result	Coefficient (R ²)
BKX_F31026	01 Jul 22	Y = 1.0018x + 1.0776	0.9997
BKX_F31027	01 Jul 22	Y = 1.0053x - 0.231	0.9995
BKX_F31028	01 Jul 22	Y = 0.9704x - 40.312	0.9992
BKX_F31029	01 Jul 22	Y = 0.9930x + 0.8234	1.0000
BKX_F31030	01 Jul 22	Y = 1.0079x + 0.515	0.9999
BKX_F31031	01 Jul 22	Y = 1.0059x - 79.295	0.9998
BKX_F31039	01 Jul 22	Y = 0.9879x + 7.3524	0.9999
BKX_F31040	01 Jul 22	Y = 0.9704x - 68.336	0.9997
BKX_F31041	01 Jul 22	Y = 1.0645x - 1.7878	0.9989
BKX_F31042	01 Jul 22	Y = 0.9983x + 3.262	0.9998
BKX_F31043	01 Jul 22	Y = 1.0069x - 6.9619	1.0000
BKX_F31044	01 Jul 22	Y = 1.0355x - 0.6214	0.9997
BKX_F31161	01 Jul 22	Y = 1.0126x + 7.7738	0.9999
BKX_F31162	01 Jul 22	Y = 0.9994x + 2.6357	0.9995
BKX_F31163	01 Jul 22	Y = 0.9774x - 55.03	0.9987
BKX_F31164	01 Jul 22	Y = -0.041x - 6.9427	0.9997
BKX_F31165	01 Jul 22	Y = 0.9893x - 6.5919	0.9998
BKX_F31166	01 Jul 22	Y = 1.0037x - 77.861	0.9996
BKX_F31200	01 Jul 22	Y = 1.0313x - 4.6892	0.9995
BKX_F31201	01 Jul 22	Y = 1.0045x + 0.15	0.9996
BKX_F31202	01 Jul 22	Y = 0.9702x - 44.156	0.9994
RYG_F50197	01 Jul 22	Y = 1.0209x - 0.179	0.9999
RYG_F50198	01 Jul 22	Y = 0.9971x - 16.648	0.9999
RYG_F50199	01 Jul 22	Y = 1.0832x - 2.6367	1.0000

ALS Laboratory Group

วันที่สอบ (Ru)		วันที่สอบ (Ru)		No. Sample
02 Nov 2021		02 Nov 2021		
ผ่าน	ไม่ผ่าน	ผ่าน	ไม่ผ่าน	
General				
<input type="checkbox"/>	<input type="checkbox"/>	1. การวางสายไฟ	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	2. การเชื่อมต่อ (วาง) สายไฟ, สายไฟ-สายไฟ	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	3. สายไฟ 3in = 3in หรือ (3in-3in Switch)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	4. โดรน (Drone)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	5. หน้าจอ (Display, Screen Contrast)	<input type="checkbox"/>	<input type="checkbox"/>
Spectrophotometer				
<input type="checkbox"/>	<input type="checkbox"/>	6. แบตเตอรี่ (Battery Backup) ≥ 2.5 VDC	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	7. ฟิลเตอร์แสง (Wavelength Control)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	8. ความยาวคลื่น (Wavelength Check)	<input type="checkbox"/>	607 \pm 607.3 nm
<input type="checkbox"/>	<input type="checkbox"/>	9. ความเข้มแสง (UV $\leq 3,000$ hour)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	10. ความเข้มแสง (Visible $< 5,000$ hour)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	11. สารเคมี (Carboxylic Acid)	<input type="checkbox"/>	<input type="checkbox"/>
pH Meter and Conductivity Meter				
<input type="checkbox"/>	<input type="checkbox"/>	12. สายไฟ (Electrode and Connection Cable)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	13. สายไฟ (Electrode and Connection Cable)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	14. สายไฟ (Electrode and Connection Cable)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	15. สายไฟ (Electrode and Connection Cable)	<input type="checkbox"/>	<input type="checkbox"/>
Turbidimeter				
<input type="checkbox"/>	<input type="checkbox"/>	16. สายไฟ (No Sample)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	17. สายไฟ (No Sample)	<input type="checkbox"/>	<input type="checkbox"/>
AUTOMATIC METER				
<input type="checkbox"/>	<input type="checkbox"/>	18. สายไฟ (No Sample)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	19. สายไฟ (No Sample)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	20. สายไฟ (No Sample)	<input type="checkbox"/>	<input type="checkbox"/>

REVIEW BY: Audhaya W. S.
APPROVED BY: Siriporn P.
NEXT CAL. DATE: 11/10/23

ARCHIMECA

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

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

ICS-2100 S/N: 15010977
AS-HV S/N: 5450A36659

For
ALS Laboratory Group (Thailand) Co., Ltd.

Operator Signature: [Signature] Date: Jan 12, 2022
 (Mr. Thitipong Piroonkrupak)
 Applications Chemist

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

451-45175 (Bangkok Rd), Bangna Thani, Bangkok 10700 THAILAND
 TEL: 0-2435-8800 Fax: 0-2435-8829 email: calcenter@sitiporn.com http://www.sitiporn.com

Cert. No. : ACC22013
Pages : 1 of 3

Calibration Certificate

Equipment : SOUND CALIBRATOR
Manufacturer : RION
Model : NC-74
Serial No.: 34178121
ID No.: RYG JS0013

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
 104 PHATHANAKAN 40, PHATHANAKAN ROAD,
 KIJWAENG PHATHANAKAN, KHET SUAN LUANG,
 BANGKOK, 10251 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 : Natchanon Piroonpau
Approved by : T. Petch
 (Thanakul Petchu)

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.

QP-TS12-04-04-020604

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACC22013
Job No. : VC65AC0054
Pages : 2 of 3

Calibration Procedure : CP-AC-02

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.	Exp. Date
Waveform Generator	33511B	MY5236742	EF-0001-22	03-Feb-23
Digital Multimeter	33461A	MY53200104	EEL-HP-040265	09-Feb-23
Digital Multimeter	33461A	MY53200106	EEL-HP-040265	09-Feb-23
Digital Multimeter	33461A	MY60024273	EEL-HP-050245	09-Feb-23
Programmable Attenuator	MA1-1070	82100114	EF-0009-22	07-Feb-23
Condenser Microphone	4180	2977909	AA-1011-22	24-Feb-23
Measuring Amplifier	NA-42KAJ	34500495	AA-3001-22	22-Feb-23
Audio Analyzer	AVB-3360A	V74406099	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).

QP-TS12-04-04-020604

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

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	3.6

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

QP-TS12-04-04-020604

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

451-45175 (Bangkok Rd), Bangna Thani, Bangkok 10700 THAILAND
 TEL: 0-2435-8800 Fax: 0-2435-8829 email: calcenter@sitiporn.com http://www.sitiporn.com

Cert. No. : ACL22026
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-421 Microphone UC-52 / Preamplifier N01-24
Serial No.: 09090671 / 184464 / 01733
ID No.: RYG JS0492

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
 104 PHATHANAKAN 40, PHATHANAKAN ROAD,
 KIJWAENG PHATHANAKAN, KHET SUAN LUANG,
 BANGKOK, 10251 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 09 JANUARY 2022
Calibration Date : 16-12 JANUARY 2022
Date of Issue : 13 JANUARY 2022

Calibrated by : Natchanon Piroonpau
Approved by : T. Petch
 (Thanakul Petchu)

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.

QP-TS12-04-04-020604

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL22026
Job No. : VC65AC0040
Pages : 2 of 8

Calibration Procedure : CP-AU-01

Calibration Method :
 This equipment was calibrated by based on IEC 61672-2 (2013) Standard for sound level meter (SLM).
 The SLM had been to Acoustical and Electrical signal test of frequency weighting with Acoustic chamber and Reference Standard Instruments.
 For test results of each item 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.	Exp. Date
Waveform Generator	33216A	MY48017076	EF-0015-23	10-Feb-22
Waveform Generator	33511B	MY5236742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53200104	EEL-HP-050264	10-Feb-22
Digital Multimeter	33461A	MY53200106	EEL-HP-050264	10-Feb-22
Digital Multimeter	33461A	MY60024273	EEL-HP-050245	10-Feb-22
Programmable Attenuator	MA1-1070	82100114	EF-0009-22	15-Sep-22
Condenser Microphone	4180	2977909	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KAJ	34500495	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).

QP-TS12-04-04-020604

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL22026
Job No. : VC65AC0040
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	✓	-	0.3	0.6
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	✓	-	0.3	0.6
For 10 Hz to 4 kHz	✓	-	0.3	0.7
For > 4 kHz to 10 kHz	✓	-	0.3	0.7
For > 10 kHz to 20 kHz	✓	-	0.3	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
A-weight - 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. Time base response	✓	-	0.2	0.3
10. Peak C - onset level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

QP-TS12-04-04-020604

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL22026
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 (91.96)	93.9	-0.0	±0.3

2. Self-generated noise
 2.1 Normal test

Frequency (Hz)	Measured value (dB)
125	11.6
1000	17.8
8000	23.6

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

Frequency (Hz)	Measured value (dB)
A-weight	11.6
C-weight	17.8
Flat	23.6

3. Acoustical signal tests of frequency weightings
 Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from intrinsic frequency weighting response curve (dB)	Acceptance Limits
125	-0.2	± 1.5
1000	-0.1	± 1.0
8000	0.2	± 0.3

QP-TS12-04-04-020604

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL22026
Job No. : VC65AC0040
Pages : 5 of 8

4. Electrical signal tests of frequency weightings
 Weighting network response with relative to 1 kHz.

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	-0.1	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	±2.0
4000	0.0	0.0	0.0	±2.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz
 5.1 Frequency weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	0.0	±0.2
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	±0.1
Slow	94.0	0.0	±0.1
Long	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

QP-TS12-04-04-020604

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviation 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	38.9	-0.1	±1.1
34.0	33.9	-0.1	±1.1
29.0	29.9	+0.1	±1.1
24.0	26.5	+2.1	±1.1
19.0	27.5	+6.1	±1.1
14.0	26.8	+12.2	±1.1
9.0	25.9	+16.1	±1.1
4.0	24.9	+16.1	±1.1

QP-TS12-04-04-02064

T. Reth

SITHIPORN SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

151/45/15 Srinakharin Rd., Bangnaeng, Bangkok 10700 THAILAND
Tel: 0435-8800 Fax: 0431-1679 E-mail: sithiporn@sithiporn.com http://www.sithiporn.com



Cert. No. : ACL22062
Page : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NR-42; Microphone UC-52; Pre-amplifier NH-24
Serial No. : 01222723 / 143841 / 22770
ID No. : RYG-FS0022

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTANAKAN 40, PHATTANAKAN ROAD,
BANGKANG PHATTANAKAN, SIBET SUAN LUANG,
BANGKOK, 10250 THAILAND

Location :
Ambient Temperature : (23.9 ± 2) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.8 ± 29) %

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

Calibrated by : Nattanon Petchai

Approved by : T. Reth
(Thumkol Petchai)

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 consent of the head of Calibration Laboratory.

QP-TS12-04-04-02064

T. Reth

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limits (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	12.0
C-weight	18.0
Flat	24.1

3. Acoustical signal tests of frequency weightings

Mean free field acoustic response at a level of 94 dB

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.4	0.4	0.4	±1.5
1000	-0.1	-0.1	-0.1	±1.0
8000	-0.2	-0.3	-0.3	±0.0

QP-TS12-04-04-02064

T. Reth

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviation 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)	Deviation 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	0.25	1	108.0	108.0	0.0	1.5; -5.0
	2	8	117.0	117.0	0.0	1.0; -2.5
	200	800	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)	Deviation 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)	Deviation 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

QP-TS12-04-04-02064

T. Reth

Calibration Procedure : CP(A)=0

Calibration Method :

This equipment was calibrated by using IEC 61672-3 (2012) Standard for sound level meter (SLM). The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instruments. For test results of each item were made by observation of each instrument's display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Exp. Date
Waveform Generator	33213A	MY40617078	IT-001-21	10-Feb-22
Waveform Generator	33511B	MY52302742	IT-001-21	10-Feb-22
Digital Multimeter	33461A	MY33220194	EEL-BP-05-0254	10-Feb-22
Digital Multimeter	33461A	MY33220076	EEL-BP-05-0254	10-Feb-22
Digital Multimeter	34461A	MY66024273	1-1510072551-1	15-Sep-22
Programmable Attenuator	MAT-100	62190114	1506-077546	08-Mar-22
Condenser Microphone	4180	2977900	AA-1009-21	05-Feb-22
Measuring Amplifier	NA-42KA	34504995	AA-0003-21	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 units maintained at :

- National Institute of Metrology (Thailand).
- Thailand Institute of Scientific and Technological Research (TISTR).

QP-TS12-04-04-02064

T. Reth

11. Overload indication

Measured value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	89.5	-0.1
Negative one-half cycle	89.5	-0.1

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviation 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

QP-TS12-04-04-02064

T. Reth

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	✓	-	0.1	0.6
1000 Hz	✓	-	0.3	0.8
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings	✓	-	-	-
For 10 Hz to 4 kHz	✓	-	0.5	0.6
For 4 kHz to 10 kHz	✓	-	0.5	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	0.3
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

QP-TS12-04-04-02064

T. Reth

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	0.0	-0.1	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	0.0	±1.5
1000	0.0	0.0	0.0	±2.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviation 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)	Deviation Value (dB)	Acceptance Limits (dB)
Fast	94.0	-0.1	-
Slow	94.0	0.0	±0.1
1 eq	94.0	0.0	±0.1

6. Long-term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviation Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.0	0.0	±0.3

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviation 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
29.0	29.0	0.0	±1.1
24.0	24.0	0.0	±1.1
19.0	27.1	0.1	±1.1
14.0	26.1	0.1	±1.1
9.0	25.1	0.1	±1.1

QP-TS12-04-04-02064

T. Reth

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	134.0	0.0	±1.0
Slow	0.25	1	108.0	108.0	0.0	1.5; -5.0
	2	8	108.0	108.0	0.0	±1.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	99.0	-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, Leq (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

QP-TS12-04-04-020604

11. Overload indication

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

12. High level stability

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

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

End of Calibration Certificate

QP-TS12-04-04-020604



Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 Microphone UC-52 / Preamplifier NH-24
Serial No. : 0069072 / 18445 / 01734
ID No. : RTG_750493

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
109 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHAOYANG PHATTHANAKAN, KHEP SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 2.3) kPa
Relative Humidity : (59.0 ± 2.0) %
Received Date : 05 JANUARY 2022
Calibration Date : 10-12 JANUARY 2022
Date of Issue : 13 JANUARY 2022

REVIEW BY : *[Signature]*
APPROVED BY : *[Signature]*
NEXT CAL DATE : 10/1/23

Calibrated by : Natsorn Pitsupuan

Approved by : *[Signature]*
(Thanakul Pichitani)

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QP-TS12-04-04-020604

Calibration Procedure : (PAC-04)

Calibration Method :

This equipment was calibrated by based on IEC-61672-1 (2013) Standard for sound level meter (SLM). The SLM had been to Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instruments.
For test results of each item 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	MY44017076	IF-0012-21	10-Feb-22
Waveform Generator	33611B	MY52307242	IF-0011-21	10-Feb-22
Digital Multimeter	35861A	MY51220104	EEL DP, 05-05-54	10-Feb-22
Digital Multimeter	35861A	MY53220076	EEL DP, 03-05-54	09-Feb-22
Digital Multimeter	34401A	MY00024273	1-1180/2521-1	15-Sep-22
Programmable Attenuator	MAT-1070	62100114	1500-0774E	08-Mar-22
Condenser Microphone	4180	7977900	AA-008-21	05-Feb-22
Measuring Amplifier	NA-42KA	54560495	AA-3003-21	16-Feb-22

2. This result of calibration was found accurate as shown on due and place of calibration for this calibrated item only.

3. This certificate is traceable to the international system of unit maintained at :

- National Institute of Metrology (Thailand).
- Thailand Institute of Scientific and Technological Research (TISTR).

QP-TS12-04-04-020604

Summary of Measurement Result 2 :

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	✓	-	0.3	0.6
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	✓	-	0.3	0.6
For 10 Hz to 4 kHz	✓	-	0.3	0.7
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

QP-TS12-04-04-020604

Result of calibration 1 :

1. Absolute sensitivity

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

2. Self-generated noise

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	9.9
C-weight	16.9
Flat	22.8

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 94 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			Acceptance Limits (dB)
	Flat	C-weight	A-weight	
125	0.4	0.4	0.4	±1.5
1000	0.0	0.0	0.0	±1.0
8000	-1.2	-1.1	-1.1	±5.0

QP-TS12-04-04-020604

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)			Acceptance Limits (dB)
	Flat	C-weight	A-weight	
63	-0.1	-0.1	-0.1	±1.0
125	0.0	0.0	0.1	±1.5
250	0.0	0.0	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±1.0
8000	0.0	0.0	0.0	±5.0

5. Frequency and time 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

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

QP-TS12-04-04-020604

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	135.1	0.1	±1.1
134.0	134.1	0.1	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.1	0.1	±1.1
114.0	114.0	0.0	±1.1
109.0	109.0	0.0	±1.1
104.0	104.1	0.1	±1.1
99.0	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
29.0	29.0	0.0	±1.1
24.0	24.0	0.0	±1.1
19.0	19.0	0.0	±1.1
14.0	14.0	0.0	±1.1
9.0	9.0	0.0	±1.1
4.0	4.0	0.0	±1.1

QP-TS12-04-04-020604

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	116.9	-0.1	1.0; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	0.25	1	108.0	108.0	0.0	1.5; -5.0
	2	8	108.0	108.0	0.0	±1.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.8	-0.2	1.5; -5.0
	2	8	108.0	107.9	-0.1	1.0; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Leq (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	135.8	-0.6	±3.0

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

QP-TS12-04-04-020604

Cert. No. : ACL22087
Job No. : VCSAC0077
Pages : 3 of 8

11. Overhaul indication

Measured value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Positive	Negative	
one-half cycle	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)	Deviation 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

(31-051) Sithiporn Rd, Bangnaemai, Bangkok 10700 THAILAND
Tel: 0-2433-8800 Fax: 0-2433-8879 e-mail: cal-center@sithiporn.com http://www.sithiporn.com



Cert. No. : ACL22182
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NR-02 Microphone UC-52 / Preamplifier NR-24
Serial No. : 00873109 / 171842 / 52465
ID No. : RYG.FS0384

Condition As Found : GOOD

Customer :

AUS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN 40, PHATHANAKAN ROAD,
KIWAENG PHATHANAKAN, 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 AUGUST 2022
Calibration Date : 26-01, ACRYRY 2022
Date of Issue : 02 SEPTEMBER 2022

REVIEWED : *Nathorn P.*
APPROVED : *Thakul P.*
RECAL DATE : 30/6/23

Calibrated by : Nathorn Pitsaporn

Approved by :

T. Petch
(Thakul Petchai)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than as full, except with the prior written approval of the head of Calibration Laboratory.

QP-TS12-04-04-020604

QP-TS12-04-04-020604

Cert. No. : ACL22182
Job No. : VCSAC0077
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	0.2
8. Level linearity including the level range control	✓	-	0.2	0.2
9. Tone burst response	✓	-	0.2	0.2
10. Peak C sound level	✓	-	0.2	0.35
11. Overhaul indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

QP-TS12-04-04-020604

QP-TS12-04-04-020604

Cert. No. : ACL22182
Job No. : VCSAC0077
Pages : 3 of 8

3. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
137.0	137.1	0.1	±1.1
136.0	136.1	0.1	±1.1
135.0	135.1	0.1	±1.1
134.0	134.1	0.1	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.1	0.1	±1.1
124.0	124.0	0.0	±1.1
119.0	119.1	0.1	±1.1
114.0	114.1	0.1	±1.1
109.0	109.1	0.1	±1.1
104.0	104.1	0.1	±1.1
99.0	99.1	0.1	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
29.0	29.0	0.0	±1.1
24.0	24.0	0.0	±1.1
19.0	19.0	0.0	±1.1
14.0	14.0	0.0	±1.1

QP-TS12-04-04-020604

Cert. No. : ACL22182
Job No. : VCSAC0077
Pages : 3 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviation 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)	Deviation Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	±5.0
	2	8	117.0	116.9	-0.1	±5.0
	200	800	134.0	134.0	0.0	±1.0
Slow	0.25	1	108.0	108.0	0.0	±5.0
	2	8	117.0	117.0	0.0	±5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	±5.0
	2	8	108.0	108.0	0.0	±5.0
	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)	Deviation 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)	Deviation Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
Positive half cycle	135.1	135.1	0.0	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

QP-TS12-04-04-020604

Cert. No. : ACL22182
Job No. : VCSAC0077
Pages : 3 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC-61672-1 (2013) Standard for sound level meter (SLM). The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instruments. For test results of each item were made by observation of each instrument 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	33441A	MY53220104	E21-30P-04-02-25	09-Feb-25
Digital Multimeter	33441A	MY53220876	E21-30P-03-02-25	09-Feb-25
Digital Multimeter	34401A	MY60052723	E21-30P-03-02-25	09-Feb-25
Programmable Attenuator	MAT-1070	42100114	EF-0006-22	07-Feb-23
Condenser Microphone	4180	2977900	AA-1013-22	24-Feb-23
Measuring Amplifier	NA-42KA	34560895	AA-3005-22	22-Feb-23

2. This result of calibration with found accurate as shown on date and place of calibration for this calibrated item only.

3. This certificate is inseparable to the international system of unit maintained at :

- National Institute of Metrology (Thailand).
- Thailand Institute of Scientific and Technological Research (TISTR).

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	-0.1	-0.1	±2.0
125	0.0	0.0	-0.1	±1.5
250	-0.1	-0.1	-0.1	±1.5
500	-0.1	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.0	0.0	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

QP-TS12-04-04-020604

Cert. No. : ACL22182
Job No. : VCSAC0077
Pages : 3 of 8

11. Overhaul indication

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

12. High level stability

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

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

End of Calibration Certificate

QP-TS12-04-04-020604

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

451-45171 Sathitvor Rd.,Bangkok, Bangkok 10700 THAILAND
Tel:0-2435-0900 Fax:0-2435-1629 e-mail:cal@cal.sithiporn.com http://www.sithiporn.com



Cert. No.: ACL22183
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamp/Filter NII-24
Serial No.: 01075425 / 169512 / 73461
ID No.: RYG P50386

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHTHANAKAN 40, PHATHTHANAKAN ROAD,
KHWAENG PHATHTHANAKAN, KHET SUANLUANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.6 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 22 AUGUST 2022
Calibration Date : 24-31 AUGUST 2022
Date of Issue : 02 SEPTEMBER 2022

Calibrated by : Natchanon Petchumai

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

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QP-TS12-04-04-020604

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Continuation of Calibration Certificate

Cert. No.: ACL22183
Job No.: VCSAC0077
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.5	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	✓	-	0.4	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. Time burst response	✓	-	0.2	0.7
10. Peak C sound level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No.: ACL22183
Job No.: VCSAC0077
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limits (dB)
93.0 (93.0)	93.0	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.4

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

Frequency Weighting (dB)	Measured value (dB)
A-weight	12.6
C-weight	13.6
Flat	24.5

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 94 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			Acceptance Limits (dB)
	Flat	C-weight	A-weight	
125	0.2	0.2	0.3	±1.5
1000	0.1	0.1	0.1	±1.0
8000	1.5	1.3	1.6	±3.0

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No.: ACL22183
Job No.: VCSAC0077
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)			Acceptance Limits (dB)
	Flat	C-weight	A-weight	
63	0.0	0.0	0.0	±2.0
125	0.0	0.1	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	±2.0
4000	0.0	0.0	0.0	±2.0
8000	0.0	0.1	0.1	±3.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long-term stability

Frequency Weighting (dB)	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.1	0.1	±0.3

QP-TS12-04-04-020604

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No.: ACL22183
Job No.: VCSAC0077
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
117.0	117.0	0.0	±1.1
116.0	116.0	0.0	±1.1
115.0	115.0	0.0	±1.1
114.0	114.0	0.0	±1.1
113.0	113.0	0.0	±1.1
112.0	112.0	0.0	±1.1
111.0	111.0	0.0	±1.1
110.0	110.0	0.0	±1.1
109.0	109.0	0.0	±1.1
108.0	108.0	0.0	±1.1
107.0	107.0	0.0	±1.1
106.0	106.0	0.0	±1.1
105.0	105.0	0.0	±1.1
104.0	104.0	0.0	±1.1
103.0	103.0	0.0	±1.1
102.0	102.0	0.0	±1.1
101.0	101.0	0.0	±1.1
100.0	100.0	0.0	±1.1
99.0	99.0	0.0	±1.1
98.0	98.0	0.0	±1.1
97.0	97.0	0.0	±1.1
96.0	96.0	0.0	±1.1
95.0	95.0	0.0	±1.1
94.0	94.0	0.0	±1.1
93.0	93.0	0.0	±1.1
92.0	92.0	0.0	±1.1
91.0	91.0	0.0	±1.1
90.0	90.0	0.0	±1.1
89.0	89.0	0.0	±1.1
88.0	88.0	0.0	±1.1
87.0	87.0	0.0	±1.1
86.0	86.0	0.0	±1.1
85.0	85.0	0.0	±1.1
84.0	84.0	0.0	±1.1
83.0	83.0	0.0	±1.1
82.0	82.0	0.0	±1.1
81.0	81.0	0.0	±1.1
80.0	80.0	0.0	±1.1
79.0	79.0	0.0	±1.1
78.0	78.0	0.0	±1.1
77.0	77.0	0.0	±1.1
76.0	76.0	0.0	±1.1
75.0	75.0	0.0	±1.1
74.0	74.0	0.0	±1.1
73.0	73.0	0.0	±1.1
72.0	72.0	0.0	±1.1
71.0	71.0	0.0	±1.1
70.0	70.0	0.0	±1.1
69.0	69.0	0.0	±1.1
68.0	68.0	0.0	±1.1
67.0	67.0	0.0	±1.1
66.0	66.0	0.0	±1.1
65.0	65.0	0.0	±1.1
64.0	64.0	0.0	±1.1
63.0	63.0	0.0	±1.1
62.0	62.0	0.0	±1.1
61.0	61.0	0.0	±1.1
60.0	60.0	0.0	±1.1
59.0	59.0	0.0	±1.1
58.0	58.0	0.0	±1.1
57.0	57.0	0.0	±1.1
56.0	56.0	0.0	±1.1
55.0	55.0	0.0	±1.1
54.0	54.0	0.0	±1.1
53.0	53.0	0.0	±1.1
52.0	52.0	0.0	±1.1
51.0	51.0	0.0	±1.1
50.0	50.0	0.0	±1.1
49.0	49.0	0.0	±1.1
48.0	48.0	0.0	±1.1
47.0	47.0	0.0	±1.1
46.0	46.0	0.0	±1.1
45.0	45.0	0.0	±1.1
44.0	44.0	0.0	±1.1
43.0	43.0	0.0	±1.1
42.0	42.0	0.0	±1.1
41.0	41.0	0.0	±1.1
40.0	40.0	0.0	±1.1
39.0	39.0	0.0	±1.1
38.0	38.0	0.0	±1.1
37.0	37.0	0.0	±1.1
36.0	36.0	0.0	±1.1
35.0	35.0	0.0	±1.1
34.0	34.0	0.0	±1.1
33.0	33.0	0.0	±1.1
32.0	32.0	0.0	±1.1
31.0	31.0	0.0	±1.1
30.0	30.0	0.0	±1.1
29.0	29.0	0.0	±1.1
28.0	28.0	0.0	±1.1
27.0	27.0	0.0	±1.1
26.0	26.0	0.0	±1.1
25.0	25.0	0.0	±1.1

QP-TS12-04-04-020604

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No.: ACL22183
Job No.: VCSAC0077
Pages : 8 of 8

11. Overload indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	89.7	±1.5
Negative one-half cycle	89.5	±1.5

12. High level stability

Frequency Weighting (dB)	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

QP-TS12-04-04-020604

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

451-45171 Sathitvor Rd.,Bangkok, Bangkok 10700 THAILAND
Tel:0-2435-0900 Fax:0-2435-1629 e-mail:cal@cal.sithiporn.com http://www.sithiporn.com



Cert. No.: ACL22183
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamp/Filter NII-24
Serial No.: 00296516 / 180412 / 88182
ID No.: RYG P59033

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHTHANAKAN 40, PHATHTHANAKAN ROAD,
KHWAENG PHATHTHANAKAN, KHET SUANLUANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 30) %

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

Calibrated by : Natchanon Petchumai

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

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QP-TS12-04-04-020604

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No.: ACL22183
Job No.: VCSAC0077
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC 61672-1 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference
Standard Instruments.
For test results of each item 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.	Exp. Date
Waveform Generator	33216A	MY48017076	EE-0015-21	10-Feb-22
Waveform Generator	33510B	MY53262342	EE-0015-21	10-Feb-22
Digital Multimeter	33461A	MY53200104	EEL-BP-050264	10-Feb-22
Digital Multimeter	33461A	MY53200768	EEL-BP-050264	08-Feb-22
Digital Multimeter	33461A	MY60054273	1-1518072523-1	12-Sep-22
Programmable Attenuator	MAT-1070	62100114	1504-07774E	08-Mar-22
Condenser Microphone	4180	2977000	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KA	34504995	AA-1005-21	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).

QP-TS12-04-04-020604

Continuation of Calibration Certificate

Cert. No. : ACL22056
Job No. : VC65AC0043
Pages : 5 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
5000 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. Time 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

QP-TS12-04-04-02064

T. Reth.

Continuation of Calibration Certificate

Cert. No. : ACL22056
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	55.9	-1.9	+1.1
49.0	49.0	0.0	+1.1
44.0	42.9	-1.1	+1.1
39.0	38.9	-0.1	+1.1
34.0	33.9	-0.1	+1.1
29.0	29.9	+0.9	+1.1
24.0	22.9	-1.1	+1.1
19.0	17.9	-1.1	+1.1
14.0	12.9	-1.1	+1.1
9.0	8.9	-0.1	+1.1

QP-TS12-04-04-02064

T. Reth.

451-4511 Sathorn Rd., Bangkok, Bangkok Bangkok 10120 THAILAND
Tel: 02-633-8888 Fax: 02-633-8877 Email: sithiporn@thai.com http://www.sithiporn.comCert. No. : ACL22056
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : KION
Model : NL-02 Microphone UC-52 / Preamplifier NH-24
Serial No. : 08873057 / 171591 / 73333
ID No. : RYG-FS3081

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
108 PHATHANAKARN-46 PHATHANAKARN RD.,
KHUANG PHATHANAKARN, KHUANG SIANG JIANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 22 AUGUST 2022
Calibration Date : 26-31 AUGUST 2022
Date of Issue : 02 SEPTEMBER 2022

Calibrated by : Sithiporn Puspitarn

Approved by : T. Reth.
(Sithiporn Puspitarn)

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QP-TS12-04-04-02064

Continuation of Calibration Certificate

Cert. No. : ACL22056
Job No. : VC65AC0043
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limits (dB)
93.9 (003,960)	93.9	0.0	±0.2

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.8

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

Frequency Weighting	Measured Value (dB)
A-weight	11.6
C-weight	17.7
Flat	23.4

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	-0.1	0.1	±1.5
1000	-0.1	-0.1	-0.1	±1.0
5000	0.7	0.7	0.7	±0.8

QP-TS12-04-04-02064

T. Reth.

Continuation of Calibration Certificate

Cert. No. : ACL22056
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. Time burst response

Time Weighting	Time 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	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5/-5.0
	200	800	127.8	127.8	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	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

QP-TS12-04-04-02064

T. Reth.

Continuation of Calibration Certificate

Cert. No. : ACL22056
Job No. : VC65AC0043
Pages : 5 of 8

A. Electrical signal tests of frequency weightings

Weighting accuracy response with reference to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	0.0	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±1.0
4000	0.0	0.0	0.0	±1.0
8000	0.0	0.1	0.1	±1.0

5. Frequency and time weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	0.0	±1.1
A-weight	94.0	0.0	±1.1
C-weight	94.0	0.0	±1.1
Flat	94.0	0.0	±1.1

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	0.0	±1.1
A-weight	94.0	0.0	±1.1
C-weight	94.0	0.0	±1.1
Flat	94.0	0.0	±1.1

A. Long-term stability

Frequency Weighting	60.00 min at initial (dB)	30.00 min at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.0	0.0	±1.1

QP-TS12-04-04-02064

T. Reth.

Continuation of Calibration Certificate

Cert. No. : ACL22056
Job No. : VC65AC0043
Pages : 8 of 8

11. Overload indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	-0.2	±1.5
Negative one-half cycle	-0.2	±1.5

12. High level stability

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

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

End of Calibration Certificate

QP-TS12-04-04-02064

T. Reth.

Continuation of Calibration Certificate

Cert. No. : ACL22056
Job No. : VC65AC0077
Pages : 9 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
5000 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. Time burst response	✓	-	0.2	0.35
10. Peak C sound level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

QP-TS12-04-04-02064

QP-TS12-04-04-02064

T. Reth.

QP-TS12-04-04-02064

T. Reth.

Continuation of Calibration Certificate

Cert. No. : ACL22181
Job No. : VCMAC0877
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limits (dB)
93.9 (93.95)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.4

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

Frequency Weighting (dB)	Measured Value (dB)
A-weight	12.0
C-weight	18.3
Flat	24.0

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 94 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance limits
125	0.2	0.2	0.2	± 1.5
1000	0.0	0.0	0.0	± 1.0
10000	0.2	0.2	0.2	± 5.0

QE-TS12-04-04-02064

T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL22181
Job No. : VCMAC0877
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	-0.1	-0.1	±2.0
125	-0.1	0.0	-0.1	±1.5
250	0.0	0.0	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.0	0.0	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

6. Long-term stability

Frequency Weighting (dB)	SLM Display at initial (dB)	SLM Display at final (dB)	Deviation Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.0	0.0	±0.3

QE-TS12-04-04-02064

T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL22181
Job No. : VCMAC0877
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviation 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)
Flat	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	5	117.0	117.0	0.0	1.0 ; -2.5
	200	300	134.0	134.0	0.0	±1.0
Slow	2	5	108.0	108.0	0.0	1.5 ; -5.0
	200	300	127.0	127.0	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
SLI	2	5	108.0	108.0	0.0	1.0 ; -2.5
	200	300	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in tone signal	Anticipated Value (dB)	Measured Value, Lpeak (dB)	Deviation 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 tone signal	Anticipated Value (dB)	Measured Value (dB)	Deviation 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

QE-TS12-04-04-02064

T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL22024
Job No. : VCMAC0840
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum permitted uncertainty (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings	✓	-	0.3	0.6
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings	✓	-	0.3	0.6
Flat 10 Hz to 4 kHz	✓	-	0.3	0.7
Flat 10 Hz to 10 kHz	✓	-	0.3	0.7
Flat 10 kHz to 20 kHz	✓	-	0.3	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long-term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Time 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

QE-TS12-04-04-02064

T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL22181
Job No. : VCMAC0877
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
137.0	137.1	0.1	±1.1
136.0	136.1	0.1	±1.1
135.0	135.1	0.1	±1.1
134.0	134.1	0.1	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.1	0.1	±1.1
124.0	124.1	0.1	±1.1
119.0	119.1	0.1	±1.1
114.0	114.1	0.1	±1.1
109.0	109.1	0.1	±1.1
104.0	104.1	0.1	±1.1
99.0	99.0	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
29.0	29.0	0.0	±1.1
24.0	24.0	0.0	±1.1
19.0	19.0	0.0	±1.1
14.0	14.0	0.0	±1.1
9.0	9.0	0.0	±1.1
4.0	4.0	0.0	±1.1

QE-TS12-04-04-02064

T. Petch.

81/45/11 Sathorn Rd, Bangkok, Thailand 10120 THAILAND
Tel: 02-253-8800 Fax: 02-253-1629 e-mail: info@sithiporn.com Web: www.sithiporn.comCert. No. : ACL22024
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : ECOM
Model : NL-42 Microphone UC-52 / Pre-amplifier NH-24
Serial No. : 00709746 / 15732 / 01297
ID No. : RYG J30491

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN 40 PHATHANAKAN ROAD,
KHWAENG PHATHANAKAN, KHEE SUAN LUANG,
BANGKOK, 10250 THAILAND.Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3.3) kPa
Relative Humidity : (50.0 ± 2.0) %
Received Date : 05 JANUARY 2022
Calibration Date : 10-12 JANUARY 2022
Date of Issue : 13 JANUARY 2022CHECKED BY :
APPROVED BY :
TEST DATE : 01/1/22

Calibrated by : Nithakorn Pitsaporn

Approved by : T. Petch.
(Thanakorn Petchai)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.

QE-TS12-04-04-02064

T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL22024
Job No. : VCMAC0840
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC 61672-1 (2013) Standard for sound level meter (SLM).
The SLM test tests to Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference
Standard Instruments.
For test results of each item 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.	Exp. Date
Waveform Generator	33520A	MY4801075	IE-0012-21	10-Feb-22
Waveform Generator	33511B	MY52102742	IE-0011-21	10-Feb-22
Digital Multimeter	33401A	MY33210104	EEL BP, 05/03/26	10-Feb-22
Digital Multimeter	33401A	MY33210076	EEL BP, 05/03/26	09-Feb-22
Digital Multimeter	34401A	MY40004273	1-15107/25251-1	15-Sep-22
Programmable Attenuator	MA17-1070	63100114	1300-077140	08-Mar-22
Condenser Microphone	4189	297960	AA-1008-23	05-Feb-22
Measuring Amplifier	NA-200A	14500495	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 suitable for the international system of unit maintained at :

3.1 National Institute of Metrology (Thailand).

3.2 Thailand Institute of Scientific and Technological Research (TISTR).

QE-TS12-04-04-02064

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QE-TS12-04-04-02064

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Cert. No. : ACL22024
Job No. : VCMAC0040
Page : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	0.0	-0.1	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	±2.0
4000	0.0	0.0	0.0	±2.0
8000	0.0	0.1	0.1	±2.0

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
A-weight	94.0	0.0	-
C-weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time weightings at 1 kHz

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

QF-TS12-04-04-02064

T. Petchu

Cert. No. : ACL22024
Job No. : VCMAC0040
Page : 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
29.0	29.0	0.0	±1.1
24.0	24.0	0.0	±1.1
19.0	19.0	0.0	±1.1
14.0	14.0	0.0	±1.1
9.0	9.0	0.0	±1.1
4.0	4.0	0.0	±1.1

QF-TS12-04-04-02064

T. Petchu

Cert. No. : ACL22024
Job No. : VCMAC0040
Page : 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	106.0	106.0	0.0	1.5; -5.0
	2	8	117.0	117.0	0.0	1.0; -2.5
Slow	200	800	134.0	134.1	0.1	±1.0
	2	8	108.0	108.0	0.0	1.5; -5.0
SEL	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5; -5.0
	2	8	108.0	108.0	0.0	1.0; -2.5
	200	800	128.0	128.1	0.1	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Leq (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
Noise	136.4	135.5	-0.9	±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-TS12-04-04-02064

T. Petchu

Cert. No. : ACL22024
Job No. : VCMAC0040
Page : 8 of 8

11. Overload indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limits
Positive one-half cycle	89.6	0.0
Negative one-half cycle	89.6	0.0
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	136.9	0.1	±0.3

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

End of Calibration Certificate

QF-TS12-04-04-02064

T. Petchu

401-45171 Sathorn Rd., Bangkok, Bangkok 10700 THAILAND
Tel: 0-2413-4800 Fax: 0-2413-4829 e-mail: sithiporn@thiporn.com http://www.sithiporn.com



Cert. No. : ACL22024
Page : 1 of 3

Calibration Certificate

Equipment : SOUND CALIBRATOR
Manufacturer : RION
Model : NC-75
Serial No. : 35002726
ID No. : 10/1/23

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAI) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KUPANGKANG PHATTHANAKAN, KIET SUAN LUANG,
BANGKOK, 10255 THAILAND.

Location :
Ambient Temperature : (23.0 ± 1) °C
Pressure : (101.3 ± 0.3) kPa
Relative Humidity : (50.0 ± 2.0) %
Received Date : 05 JANUARY 2022
Calibration Date : 10 JANUARY 2022
Date of Issue : 13 JANUARY 2022

REVIEW BY : *Thakorn Petchu*
APPROVED BY : *Thakorn Petchu*
NEXT CAL DATE : 10/1/23

Calibrated by : Thakorn Petchu

Approved by : *T. Petchu*
(Thakorn Petchu)

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QF-TS12-04-04-02064

Cert. No. : ACL22024
Job No. : VCMAC0040
Page : 2 of 3

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC-60942:2003 Standard.
The sound pressure level, frequency and total duration 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	MY5220742	EF-0011-23	10-Feb-22
Digital Multimeter	33461A	MY5220104	EF1-BP-05-0264	10-Feb-22
Digital Multimeter	33461A	MY5220076	EF1-BP-05-0264	10-Feb-22
Digital Multimeter	33461A	MY6004273	1-151072523-1	15-Sep-22
Programmable Attenuator	NA61-1070	42100114	1500-077746	08-Mar-22
Condenser Microphone	4180	2977900	AA-1000-21	05-Feb-22
Measuring Amplifier	NA-42CA1	3450495	AA-3003-21	16-Feb-22
Audio Analyzer	AVR-3360A	V7408609	EF-010-21	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-TS12-04-04-02064

T. Petchu

Cert. No. : ACL22024
Job No. : VCMAC0040
Page : 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

QF-TS12-04-04-02064

T. Petchu

401-45171 Sathorn Rd., Bangkok, Bangkok 10700 THAILAND
Tel: 0-2413-4800 Fax: 0-2413-4829 e-mail: sithiporn@thiporn.com http://www.sithiporn.com



Cert. No. : ACL22024
Page : 1 of 3

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NC-402 Microphone UC-52 / Preamplifier NH-24
Serial No. : 01222724 / 14384 / 22771
ID No. : RYG-F30023

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAI) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KUPANGKANG PHATTHANAKAN, KIET SUAN LUANG,
BANGKOK, 10255 THAILAND.

Location :
Ambient Temperature : (23.0 ± 1) °C
Pressure : (101.3 ± 0.3) kPa
Relative Humidity : (50.0 ± 2.0) %
Received Date : 05 JANUARY 2022
Calibration Date : 10-12 JANUARY 2022
Date of Issue : 13 JANUARY 2022

REVIEW BY : *Thakorn Petchu*
APPROVED BY : *Thakorn Petchu*
NEXT CAL DATE : 10/1/23

Calibrated by : Thakorn Petchu

Approved by : *T. Petchu*
(Thakorn Petchu)

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QF-TS12-04-04-02064

Cert. No. : ACL22024
Job No. : VCMAC0040
Page : 2 of 3

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 been to Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instruments.

For test results of each item 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	33511B	MY5220742	EF-0011-23	10-Feb-22
Waveform Generator	33511B	MY5220742	EF-0011-23	10-Feb-22
Digital Multimeter	33461A	MY5220104	EF1-BP-05-0264	10-Feb-22
Digital Multimeter	33461A	MY5220076	EF1-BP-05-0264	10-Feb-22
Digital Multimeter	33461A	MY6004273	1-151072523-1	15-Sep-22
Programmable Attenuator	NA61-1070	42100114	1500-077746	08-Mar-22
Condenser Microphone	4180	2977900	AA-1000-21	05-Feb-22
Measuring Amplifier	NA-42CA1	3450495	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).

QF-TS12-04-04-02064

T. Petchu

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	✓	-	0.7	0.3
9. Time 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

QP-TS12-04-04-020604

T. Peth.

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
127.0	127.0	0.0	±1.1
126.0	126.0	0.0	±1.1
125.0	125.0	0.0	±1.1
124.0	124.0	0.0	±1.1
123.0	123.0	0.0	±1.1
122.0	122.0	0.0	±1.1
121.0	121.0	0.0	±1.1
120.0	120.0	0.0	±1.1
119.0	119.0	0.0	±1.1
118.0	118.0	0.0	±1.1
117.0	117.0	0.0	±1.1
116.0	116.0	0.0	±1.1
115.0	115.0	0.0	±1.1
114.0	114.0	0.0	±1.1
113.0	113.0	0.0	±1.1
112.0	112.0	0.0	±1.1
111.0	111.0	0.0	±1.1
110.0	110.0	0.0	±1.1
109.0	109.0	0.0	±1.1
108.0	108.0	0.0	±1.1
107.0	107.0	0.0	±1.1
106.0	106.0	0.0	±1.1
105.0	105.0	0.0	±1.1
104.0	104.0	0.0	±1.1
103.0	103.0	0.0	±1.1
102.0	102.0	0.0	±1.1
101.0	101.0	0.0	±1.1
100.0	100.0	0.0	±1.1
99.0	99.0	0.0	±1.1
98.0	98.0	0.0	±1.1
97.0	97.0	0.0	±1.1
96.0	96.0	0.0	±1.1
95.0	95.0	0.0	±1.1
94.0	94.0	0.0	±1.1
93.0	93.0	0.0	±1.1
92.0	92.0	0.0	±1.1
91.0	91.0	0.0	±1.1
90.0	90.0	0.0	±1.1
89.0	89.0	0.0	±1.1
88.0	88.0	0.0	±1.1
87.0	87.0	0.0	±1.1
86.0	86.0	0.0	±1.1
85.0	85.0	0.0	±1.1
84.0	84.0	0.0	±1.1
83.0	83.0	0.0	±1.1
82.0	82.0	0.0	±1.1
81.0	81.0	0.0	±1.1
80.0	80.0	0.0	±1.1
79.0	79.0	0.0	±1.1
78.0	78.0	0.0	±1.1
77.0	77.0	0.0	±1.1
76.0	76.0	0.0	±1.1
75.0	75.0	0.0	±1.1
74.0	74.0	0.0	±1.1
73.0	73.0	0.0	±1.1
72.0	72.0	0.0	±1.1
71.0	71.0	0.0	±1.1
70.0	70.0	0.0	±1.1
69.0	69.0	0.0	±1.1
68.0	68.0	0.0	±1.1
67.0	67.0	0.0	±1.1
66.0	66.0	0.0	±1.1
65.0	65.0	0.0	±1.1
64.0	64.0	0.0	±1.1
63.0	63.0	0.0	±1.1
62.0	62.0	0.0	±1.1
61.0	61.0	0.0	±1.1
60.0	60.0	0.0	±1.1
59.0	59.0	0.0	±1.1
58.0	58.0	0.0	±1.1
57.0	57.0	0.0	±1.1
56.0	56.0	0.0	±1.1
55.0	55.0	0.0	±1.1
54.0	54.0	0.0	±1.1
53.0	53.0	0.0	±1.1
52.0	52.0	0.0	±1.1
51.0	51.0	0.0	±1.1
50.0	50.0	0.0	±1.1
49.0	49.0	0.0	±1.1
48.0	48.0	0.0	±1.1
47.0	47.0	0.0	±1.1
46.0	46.0	0.0	±1.1
45.0	45.0	0.0	±1.1
44.0	44.0	0.0	±1.1
43.0	43.0	0.0	±1.1
42.0	42.0	0.0	±1.1
41.0	41.0	0.0	±1.1
40.0	40.0	0.0	±1.1
39.0	39.0	0.0	±1.1
38.0	38.0	0.0	±1.1
37.0	37.0	0.0	±1.1
36.0	36.0	0.0	±1.1
35.0	35.0	0.0	±1.1
34.0	34.0	0.0	±1.1
33.0	33.0	0.0	±1.1
32.0	32.0	0.0	±1.1
31.0	31.0	0.0	±1.1
30.0	30.0	0.0	±1.1
29.0	29.0	0.0	±1.1
28.0	28.0	0.0	±1.1
27.0	27.0	0.0	±1.1
26.0	26.0	0.0	±1.1
25.0	25.0	0.0	±1.1
24.0	24.0	0.0	±1.1
23.0	23.0	0.0	±1.1
22.0	22.0	0.0	±1.1
21.0	21.0	0.0	±1.1
20.0	20.0	0.0	±1.1
19.0	19.0	0.0	±1.1
18.0	18.0	0.0	±1.1
17.0	17.0	0.0	±1.1
16.0	16.0	0.0	±1.1
15.0	15.0	0.0	±1.1
14.0	14.0	0.0	±1.1
13.0	13.0	0.0	±1.1
12.0	12.0	0.0	±1.1
11.0	11.0	0.0	±1.1
10.0	10.0	0.0	±1.1
9.0	9.0	0.0	±1.1
8.0	8.0	0.0	±1.1
7.0	7.0	0.0	±1.1
6.0	6.0	0.0	±1.1
5.0	5.0	0.0	±1.1
4.0	4.0	0.0	±1.1
3.0	3.0	0.0	±1.1
2.0	2.0	0.0	±1.1
1.0	1.0	0.0	±1.1
0.0	0.0	0.0	±1.1

QP-TS12-04-04-020604

T. Peth.



Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NR-02 Microphone UC-52 / Pre-amplifier NH-24
Serial No. : 0000074 / 186407 / 01736
ID No. : RYO-730493

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PRATHANAKAN 46, PRATHANAKAN ROAD,
KHU ASANG, PRATHANAKAN KHU SAN, JANG,
BANGKOK, 10255 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3.1) °C
Pressure : (101.3 ± 1.1) kPa
Relative Humidity : (50.0 ± 2.0) %

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

Calibrated by : Nattakorn Pongpattana

Approved by : T. Peth.
(T. Peth.)

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QP-TS12-04-04-020604

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limits (dB)
93.0 (01.04)	93.0	-0.5	±0.3

2. Self-generated noise

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			Acceptance Limits
	Flat	C-weight	A-weight	
125	0.4	0.4	0.4	±1.5
1000	0.0	0.0	0.0	±1.0
8000	-1.0	-0.9	-0.9	±1.0

QP-TS12-04-04-020604

T. Peth.

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. Time burst response

Time Weighting	Time 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	134.0	0.0	±1.0
Slow	0.25	1	108.0	108.0	0.0	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
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	±1.0

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	138.4	138.3	-0.1	±1.0
Negative half cycle	138.4	138.1	-0.3	±1.0

QP-TS12-04-04-020604

T. Peth.

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 test was to Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instruments.
For test results of each item were made by observation of each instrument 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	33230A	MY48013076	33-0015-21	10-Feb-22
Waveform Oscilloscope	335110	MY22302742	17-0011-21	10-Feb-22
Digital Multimeter	33461A	MY33220104	EEL RP, 05/0264	08-Feb-22
Digital Multimeter	33461A	MY33220076	EEL RP, 03/0264	08-Feb-22
Digital Multimeter	33461A	MY60020273	1-1310072521-1	15-Sep-22
Programmable Attenuator	MA1-1020	62100114	1500-077748	08-Mar-22
Conductance Microphone	4186	2979600	AA-1009-21	05-Feb-22
Measuring Amplifier	NA-40KA	34502005	AA-3009-21	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 member to the international system of unit maintained at :

3.1 National Institute of Metrology (NIMTECH).

3.2 Thailand Institute of Scientific and Technological Research (TISTR).

4. Electrical signal tests of frequency weightings

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			Acceptance Limits
	Flat	C-weight	A-weight	
63	-0.1	-0.1	0.0	±2.0
125	-0.1	0.0	0.0	±1.5
250	0.0	0.0	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
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Continuation of Calibration Certificate

Cert. No. : ACL22029
Job No. : YC85AC0040
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.2

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

Frequency Weighting (dB)	Measured value (dB)
A-weight	10.8
C-weight	17.4
Flat	23.3

3. Acoustic signal tests of frequency weightings

Meter free-field acoustic response at a level of 94 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)	Acceptance Limits
125	0.2	±1.5
1000	0.0	±1.0
3000	-0.8	±1.0

QP-TS12-04-04-020664

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Continuation of Calibration Certificate

Cert. No. : ACL22029
Job No. : YC85AC0040
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with reference to (dB)

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)	Acceptance Limits
63	-0.1	±2.0
125	-0.1	±1.5
250	0.0	±1.5
500	0.0	±1.5
1000	0.0	±1.0
2000	0.0	±2.0
4000	0.0	±2.0
8000	0.0	±2.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weightings at 1 kHz

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

6. Long-term stability

Frequency Weighting (dB)	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

QP-TS12-04-04-020664

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Continuation of Calibration Certificate

Cert. No. : ACL22029
Job No. : YC85AC0040
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
129.9	129.9	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
29.0	29.0	0.0	±1.1
24.0	24.0	0.0	±1.1
19.0	19.0	0.0	±1.1
14.0	14.0	0.0	±1.1
9.0	9.0	0.0	±1.1
4.0	4.0	0.0	±1.1

QP-TS12-04-04-020664

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Continuation of Calibration Certificate

Cert. No. : ACL22029
Job No. : YC85AC0040
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. Time burst response

Time Weighting	Time burst duration, T _b (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	106.0	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	0.25	1	106.0	106.0	0.0	1.5; -5.0
	2	8	127.6	127.6	0.0	±1.0
	200	800	134.0	134.0	0.0	±1.0
SEL	0.25	1	96.0	96.0	-0.1	1.5; -5.0
	2	8	106.0	106.0	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 (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	136.4	136.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

QP-TS12-04-04-020664

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Continuation of Calibration Certificate

Cert. No. : ACL22029
Job No. : YC85AC0040
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 (dB)	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

QP-TS12-04-04-020664

T. Petch.

61145/01 Sukhvitthi Rd., Bangkok, Thailand 10110 TEL: 02-6435-8800 FAX: 02-6435-1679 E-mail: cal@calibration.com URL: www.calibration.com

Cert. No. : ACL22194
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-02 Microphone UC-52 / Pre-amplifier NH-24
Serial No. : 06997148 / 179117 / 87524
ID No. : RYU J50438

Condition As Found : GOOD

Customer : AJS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN 46, PHATHANAKAN ROAD,
KIWAENG PHATHANAKAN, KHEE SUAN LUANG,
RANGKOK, 10250 THAILAND.Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (53.0 ± 2) %
Received Date : 06 SEPTEMBER 2022
Calibration Date : 07-09 SEPTEMBER 2022
Date of Issue : 14 SEPTEMBER 2022REVIEW BY :
APPROVED BY :
NEXT CAL DATE : 9/9/23

Calibrated by : Natchanon Pitsupai

Approved by : T. Petch.
(Thanakorn Petchai)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. : ACL22194
Job No. : YC85AC0040
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC 61672-A (2013) Standard for sound level meter (SLM).
The SLM had been tested to Acoustic and Electrical signal tests of frequency weightings with Acoustic chamber and Reference
Standard Instruments.
For tests results of each item were made by observation of each instrument display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Exp. Date
Waveform Generator	33211A	MY80017036	IF-0087-22	04-Feb-23
Waveform Generator	33211B	MY822102742	IF-0088-22	04-Feb-23
Digital Multimeter	34461A	MY53201064	EEL-RP-04/0265	09-Feb-23
Digital Multimeter	34461A	MY53200936	EEL-RP-03/0265	09-Feb-23
Digital Multimeter	34461A	MY50034273	EEL-RP-05/0265	09-Feb-23
Programmable Attenuator	MAF-1079	62100114	IF-0369-22	07-Feb-23
Concussion Microphone	4186	29779960	AA-B113-22	21-Feb-23
Measuring Amplifier	NA-42KM	34560495	AA-0005-22	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 in :

3.1 National Institute of Metrology (Thailand).

3.2 Thailand Institute of Scientific and Technological Research (TISTR).

Continuation of Calibration Certificate

Cert. No. : ACL22194
Job No. : YC85AC0040
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	✓	-	0.3	0.6
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.2	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings	✓	-	0.3	0.6
For 10 Hz to 4 kHz	✓	-	0.3	0.7
For 4 kHz to 19 kHz	✓	-	0.2	0.6
For 19 kHz to 20 kHz	✓	-	0.2	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.7
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. Time burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.3
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

QP-TS12-04-04-020664

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QP-TS12-04-04-020664

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4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	±2.0
125	0.0	0.1	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.1	±2.0
4000	0.1	0.1	0.1	±2.0
8000	0.1	0.1	0.1	±2.0

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
A-weight	94.0	0.0	-
C-weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time weightings at 1 kHz

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

6. Long-term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.1	0.1	±0.2

QP-TS12-04-04-02064

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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	135.1	0.1	±1.1
134.0	134.1	0.1	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.1	0.1	±1.1
114.0	114.1	0.1	±1.1
109.0	109.0	0.0	±1.1
104.0	104.1	0.1	±1.1
99.0	99.1	0.1	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
29.0	29.0	0.0	±1.1
24.0	24.0	0.0	±1.1
19.0	19.0	0.0	±1.1
14.0	14.0	0.0	±1.1
9.0	9.0	0.0	±1.1
4.0	4.0	0.0	±1.1

QP-TS12-04-04-02064

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6. 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

6. Time burst response

Time Weighting	Time 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	116.9	-0.1	1.0/-2.5
Slow	2	8	108.0	108.0	0.0	1.5/-5.0
	200	800	127.6	127.6	0.0	±0.6
SEL	0.25	1	96.0	96.0	0.0	1.5/-5.0
	2	8	108.0	107.9	-0.1	1.0/-2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Leq (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	133.4	133.1	-0.3	±2.0

QP-TS12-04-04-02064

T. Reth

11. Overload indication

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

QP-TS12-04-04-02064

T. Reth

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 Microphone UC-52 / Preamp/for NH-24
Serial No. : 00294517 / 179129 / 87527
ID No. : RYG F90434

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN 40, PHATHANAKAN ROAD,
KORWATONG PHATHANAKAN, KURT SIEM LUKANG,
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 : Nithakul Pichasri

Approved by : T. Reth
(Nithakul Pichasri)

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 local A/C Calibration Laboratory.

QP-TS12-04-04-02064

T. Reth

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. Acoustic signal tests of frequency weightings	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings	✓	-	0.3	0.6
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. Time burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.3
11. Overload indication	✓	-	0.2	0.2
12. High level stability	✓	-	0.1	0.1

QP-TS12-04-04-02064

T. Reth

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
93.9 (93.96)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.4

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

Frequency Weighting	Measured value (dB)
A-weight	11.6
C-weight	17.7
Flat	23.4

3. Acoustic signal tests of frequency weightings

Mean free-field acoustic response at a level of 94 dB

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.1	0.1	±1.2
1000	0.0	0.0	0.0	±1.0
8000	0.0	0.1	0.1	±1.0

QP-TS12-04-04-02064

T. Reth

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.1	0.0	±2.0
125	0.0	0.1	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.1	±2.0
4000	0.0	0.1	0.1	±2.0
8000	0.0	0.1	0.1	±2.0

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
Imp	94.0	0.0	±0.1

6. Long-term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.1	0.1	±0.3

QP-TS12-04-04-02064

T. Reth

Certi. No. : ACL22087
Job No. : VCRSAC0863
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	104.1	0.1	±1.1
99.0	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
29.0	29.0	0.0	±1.1
24.0	24.0	0.0	±1.1
19.0	19.1	0.1	±1.1
14.0	14.1	0.1	±1.1
9.0	9.1	0.1	±1.1

QP-TS12-04-04-02064

T. Peth.

Certi. No. : ACL22087
Job No. : VCRSAC0863
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. Time burst response

Time Weighting	Time burst duration, T ₉₀ (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	106.0	106.0	0.0	±1.1
	2	8	117.0	117.0	0.0	±1.1
	200	800	134.0	134.1	0.1	±1.1
Slow	0.25	1	106.0	106.0	0.0	±1.1
	2	8	127.6	127.6	0.0	±1.1
	200	800	127.6	127.6	0.0	±1.1
SEL	0.25	1	99.0	99.0	0.0	±1.1
	2	8	106.0	106.0	0.0	±1.1
	200	800	128.0	128.1	0.1	±1.1

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Leq (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±1.1
One	136.4	136.5	0.1	±1.1

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	±1.1
Positive half cycle	135.4	135.4	0.0	±1.1
Negative half cycle	135.4	135.1	-0.3	±1.1

QP-TS12-04-04-02064

T. Peth.

Certi. No. : ACL22087
Job No. : VCRSAC0863
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
88.6	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

QP-TS12-04-04-02064

T. Peth.

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY45/45/1 Sithiporn Rd., Banghura, Bangkok 10700 THAILAND
Tel: 02-2433-8800 Fax: 02-2433-1629 e-mail: cal-cert@sitthiporn.com http://www.sitthiporn.comCerti. No. : ACL22199
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : ECOM
Model : NL-42 Microphone UC-52 / Preamplifier NH-24
Serial No. : 00597169 / 130411 / 83181
ID No. : RYG-FS0429

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN 40, PHATHANAKAN ROAD,
KUPWANG PHATHANAKAN, KHUET SUAN JANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 2.0) %

Received Date : 06 SEPTEMBER 2022
Calibration Date : 07-09 SEPTEMBER 2022
Date of Issue : 14 SEPTEMBER 2022

Calibrated by : Natchanon Pichaiwan

Approved by : T. Peth.
(Natchanon Pichaiwan)

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.

QP-TS12-04-04-02064

SITHIPORN / SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORYCerti. No. : ACL22199
Job No. : VCRSAC0861
Pages : 2 of 8

Calibration Procedure : CHA-01

Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2003) Standard for sound level meter (SLM).
The SLM had been to Acoustic and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instrument.

For test results of each item were made by observation of each instrument display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Certi. No.	Exp. Date
Waveform Generator	33210A	MY40017076	EE-0007-22	04-Feb-23
Waveform Oscillator	33511B	MY2202142	EE-0008-22	04-Feb-23
Digital Multimeter	33461A	MY33220104	EE-0009-22	09-Feb-23
Digital Multimeter	34461A	MY33220107	EE-0010-22	09-Feb-23
Digital Multimeter	34461A	MY33220108	EE-0011-22	09-Feb-23
Programmable Attenuator	MAT-1070	42100114	EE-0009-22	07-Feb-23
Condenser Microphone	4180	2977900	AA-1015-22	24-Feb-23
Measuring Amplifier	NA-42Kd	34500495	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 :

- National Institute of Metrology (Thailand).
- Thailand Institute of Scientific and Technological Research (TISTR).

QP-TS12-04-04-02064

T. Peth.

SITHIPORN / SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORYCerti. No. : ACL22199
Job No. : VCRSAC0861
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum permitted uncertainty (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustic signal tests of frequency weightings	✓	-	0.3	0.6
120 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings	✓	-	0.3	0.6
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For 5 kHz to 10 kHz	✓	-	0.3	0.7
For 10 kHz to 20 kHz	✓	-	0.3	0.7
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. Time 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

QP-TS12-04-04-02064

T. Peth.

SITHIPORN / SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORYCerti. No. : ACL22199
Job No. : VCRSAC0861
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limits (dB)
93.9 (0.35)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.1

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

Frequency Weighting	Measured value (dB)
A-weight	13.1
C-weight	19.3
Flat	24.8

3. Acoustical signal tests of frequency weightings

Mean free-field acoustic response at a level of 94 dB

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.1	0.1	±1.5
1000	0.0	0.0	0.0	±1.0
5000	1.2	1.3	1.2	±5.0

QP-TS12-04-04-02064

T. Peth.

SITHIPORN / SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORYCerti. No. : ACL22199
Job No. : VCRSAC0861
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	-0.1	-0.1	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	±0.1
Slow	94.0	0.0	±0.1
Long	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	±0.2

QP-TS12-04-04-02064

T. Peth.

SITHIPORN / SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORYCerti. No. : ACL22199
Job No. : VCRSAC0861
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
29.0	29.0	0.0	±1.1
24.0	24.0	0.0	±1.1
19.0	19.0	0.0	±1.1
14.0	14.0	0.0	±1.1
9.0	9.0	0.0	±1.1

QP-TS12-04-04-02064

T. Peth.

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviation 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)	Deviation 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	0.25	1	108.0	108.0	0.0	1.5; -5.0
	2	8	127.6	127.6	0.0	±1.0
	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, Lepeak (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Continuous	135.0	135.0	0.0	-
One	136.4	136.3	-0.1	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviation 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

QP-TS12-04-04-02064

T. Rth.

11. Overload indication

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

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviation 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

QP-TS12-04-04-02064

T. Rth.

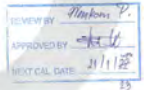
Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NR-40 Microphone UC-51 / Preamplifier NH-24
Serial No. : 02096515 / 179119 / 87526
ID No. : RYG_P50412

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN 40, PHA THANAKAN ROAD,
KHUANG PHATHANAKAN, KHUANG PHATHANAKAN,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 2.0) %
Received Date : 14 JANUARY 2022
Calibration Date : 21-24 JANUARY 2022
Date of Issue : 25 JANUARY 2022



Calibrated by : Natchanon Pichaiwan

Approved by : T. Rth.
(Thanakorn Pichaiwan)

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.

QP-TS12-04-04-02064

Calibration Procedure : CP-06-01

Calibration Method :

Test equipment was calibrated by based on IEC-61672-1 (2013) Standard for sound level meter (SLM).
The SLM had been in Acoustic and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instruments.

For test results of each item were made by observation of each instrument display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Exp. Date
Waveform Generator	53210A	RY6017076	IE-0012-21	10-Feb-22
Waveform Generator	22511B	MY32302742	IE-0012-21	10-Feb-22
Digital Multimeter	3440A	MY3220104	EE-001-05/0204	10-Feb-22
Digital Multimeter	2540A	MY3220076	EE-001-05/0204	08-Feb-22
Digital Multimeter	3440A	MY6002473	IE-100125251-1	15-Sep-22
Programmable Attenuator	MAT-1070	62100114	R00-07724E	09-Mar-22
Condenser Microphone	4190	2077900	AS-1006-21	05-Feb-22
Measuring Amplifier	NA-42KA1	3456005	IA-0003-21	16-Feb-22

2. This result of calibration was found accurate as shown on date and place of calibration for this calibration 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).

QP-TS12-04-04-02064

T. Rth.

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	✓	-	0.3	0.6
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	✓	-	0.3	0.6
For 10 Hz to 4 kHz	✓	-	0.3	0.7
For > 4 kHz to 10 kHz	✓	-	0.3	1.0
For > 10 kHz to 20 kHz	✓	-	0.2	0.2
5. Frequency and time weightings at 1 kHz	✓	-	0.1	0.1
6. Long-term stability	✓	-	0.2	0.3
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	0.3
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

QP-TS12-04-04-02064

T. Rth.

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
93.9 (03.50)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Signal test

Measured Value (dB)
13.6

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

Frequency Weighting	Measured value (dB)
A-weight	11.6
C-weight	17.7
Flat	23.1

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.1	0.1	±1.5
1000	0.0	0.0	0.0	±1.0
8000	-0.2	-0.2	-0.2	±1.0

QP-TS12-04-04-02064

T. Rth.

4. Electrical signal tests of frequency weightings

Weighting network response with reference to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	-0.1	0.0	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±1.0
4000	0.0	0.0	0.0	±1.0
8000	0.0	0.1	0.1	±1.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

6. Long-term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviation Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.0	0.0	±0.3

QP-TS12-04-04-02064

T. Rth.

7. Level linearity on the reference level range

Assigned Value (dB)	Measured Value (dB)	Deviation 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	63.9	-0.1	±1.1
59.0	59.0	0.0	±1.1
54.0	53.9	-0.1	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	38.9	-0.1	±1.1
34.0	34.0	0.0	±1.1
29.0	29.0	0.0	±1.1
24.0	24.0	0.0	±1.1
19.0	19.0	0.0	±1.1
14.0	14.0	0.0	±1.1
9.0	9.0	0.0	±1.1

QP-TS12-04-04-02064

T. Rth.

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviation 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)	Deviation 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	0.25	1	108.0	108.0	0.0	1.5; -5.0
	2	8	127.6	127.6	0.0	±1.0
	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, Lepeak (dB)	Deviation 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)	Deviation 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

QP-TS12-04-04-02064

T. Rth.

Cert. No. : ACL22231
Job No. : VC65AC0088
Pages : 3 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	SIM Display at initial (dB)	SIM 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

QF-TS12-04-04-02064

831-8531 Sotheby Rd, Bangnae, Bangkok 10710 THAILAND
Tel: 0-2433-8822 Fax: 0-2433-1676 e-mail: cal@sitp.com http://www.sitp.comCert. No. : ACL22231
Job No. : VC65AC0088
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : EION
Model : NL-42 / Microphone UC-52 / Preampifier NH-24
Serial No. : 80073156 / 176011 / 83180
ID No. : RYO, P50301

Condition As Found :

GOOD

Customer :

ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANKAN 40, PHATHANKAN ROAD,
KIWAENG PHATHANKAN, KHEB SUAN UANG,
BANGKOK, 10250 THAILAND.

Location :

-

Ambient Temperature :

(23.0 ± 3) °C

Pressure :

(101.3 ± 3) kPa

Relative Humidity :

(50.0 ± 2.0) %

Received Date :

03 OCTOBER 2022

Calibration Date :

18-19 OCTOBER 2022

Date of Issue :

20 OCTOBER 2022

Calibrated by :

Nathakorn Pitsupai

Approved by :

T. Ratanaporn
(Thanakorn Petchum)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory.

QF-TS12-04-04-02064

Cert. No. : ACL22231
Job No. : VC65AC0088
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permissible 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 16 kHz	✓	-	0.3	0.7
For > 16 kHz to 20 kHz	-	-	-	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long-term stability	✓	-	0.2	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.2
8. Level linearity including the level range control	✓	-	0.2	0.2
9. Time 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

QF-TS12-04-04-02064

Cert. No. : ACL22231
Job No. : VC65AC0088
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limits (dB)
93.9 (93.95)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Noise 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	9.9
C-weight	16.7
Flat	22.5

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 94 dB

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	-7.6	-1.6	-7.3	±1.5
1000	0.5	0.5	-0.5	±1.0
8000	-5.1	-3.1	-5.1	±0.0

QF-TS12-04-04-02064

Cert. No. : ACL22231
Job No. : VC65AC0088
Pages : 5 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
117.0	117.0	0.0	±1.1
118.0	118.0	0.0	±1.1
119.0	119.0	0.0	±1.1
120.0	120.0	0.0	±1.1
121.0	121.0	0.0	±1.1
122.0	121.9	-0.1	±1.1
123.0	123.0	0.0	±1.1
124.0	124.0	0.0	±1.1
125.0	125.0	0.0	±1.1
126.0	126.0	0.0	±1.1
127.0	127.0	0.0	±1.1
128.0	128.0	0.0	±1.1
129.0	129.0	0.0	±1.1
130.0	130.0	0.0	±1.1
131.0	131.0	0.0	±1.1
132.0	132.0	0.0	±1.1
133.0	133.0	0.0	±1.1
134.0	134.0	0.0	±1.1
135.0	135.0	0.0	±1.1
136.0	136.0	0.0	±1.1
137.0	137.0	0.0	±1.1
138.0	138.0	0.0	±1.1
139.0	139.0	0.0	±1.1
140.0	140.0	0.0	±1.1
141.0	141.0	0.0	±1.1
142.0	142.0	0.0	±1.1
143.0	143.0	0.0	±1.1
144.0	144.0	0.0	±1.1
145.0	145.0	0.0	±1.1
146.0	146.0	0.0	±1.1
147.0	147.0	0.0	±1.1
148.0	148.0	0.0	±1.1
149.0	149.0	0.0	±1.1
150.0	150.0	0.0	±1.1
151.0	151.0	0.0	±1.1
152.0	152.0	0.0	±1.1
153.0	153.0	0.0	±1.1
154.0	154.0	0.0	±1.1
155.0	155.0	0.0	±1.1
156.0	156.0	0.0	±1.1
157.0	157.0	0.0	±1.1
158.0	158.0	0.0	±1.1
159.0	159.0	0.0	±1.1
160.0	160.0	0.0	±1.1
161.0	161.0	0.0	±1.1
162.0	162.0	0.0	±1.1
163.0	163.0	0.0	±1.1
164.0	164.0	0.0	±1.1
165.0	165.0	0.0	±1.1
166.0	166.0	0.0	±1.1
167.0	167.0	0.0	±1.1
168.0	168.0	0.0	±1.1
169.0	169.0	0.0	±1.1
170.0	170.0	0.0	±1.1
171.0	171.0	0.0	±1.1
172.0	172.0	0.0	±1.1
173.0	173.0	0.0	±1.1
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176.0	176.0	0.0	±1.1
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313.0	313.0	0.0	±1.1
314.			

Certificate of Calibration

Certificate No.: C-01949
Page 1 of 2

Equipment Name: Non-Destructive Moisture Meter
Manufacturer: OTC/OTC
Model: M202.2
Serial No.: 3031431
ID No.: 01949

Customer: A.S. Laboratory Group (Thailand) Co., Ltd.
Address: 104 Pathakarn Rd. Wattana
Bangkok 10000 Thailand
Tel: (66) 02-8680812/13 Fax: (66) 02-8680800

Reference Used During Calibration:
1. Standard Temperature Probe Model: STS-100 A100
Serial No.: 62780-06, Due date: 25 Mar 2022
2. Digital Temperature Indicator Model: DT-1200-A-MK
Serial No.: 871471-Q259, Due date: 04 Jun 2022

Calibration Procedure:
The temperature calibration was done by in-house calibration method using a NIST Class 0.01 standard, in comparison method with standard digital temperature indicator and standard temperature probe. The temperature probe was used based on ITS-90.

Received on: 30 Jun 2022
Calibration done: 17 Jun 2022
Issue date: 17 Jun 2022

Calibration Condition:
Temperature: 23.53 °C
Relative Humidity: 55.415%

REVIEW BY: *[Signature]*
APPROVED BY: *[Signature]*
NEXT CAL DATE: 16/12/25

Calibrated by: M. Somchai Thairasakul
Approved Signature: M. Somchai Thairasakul
Calibration Department Manager

This certificate is valid only for the equipment and conditions stated herein. It is not valid for other equipment or conditions. The certificate is valid only for the equipment and conditions stated herein. It is not valid for other equipment or conditions.

Result of Calibration: Without Adjustment, With Adjustment
Calibration Range: 20 - 40 °C

Table 1: This equipment was connected with standard probe Model: HP3002.2.5/N, 18021206.
Dimension: Diameter 3.4 mm, Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
30	33.054	33.0	-0.1	0.009
35	33.043	33.0	-0.1	0.009
35	33.038	33.0	-0.1	0.009
35	33.028	33.0	-0.1	0.009
35	33.022	33.0	-0.1	0.009

Table 2: This equipment was connected with temperature probe Model: HP3002.2.5/N, 18021206.
Dimension: Diameter 3.4 mm, Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
70	33.043	33.0	-0.1	0.009
70	33.043	33.0	-0.1	0.009
70	33.038	33.0	-0.1	0.009
70	33.028	33.0	-0.1	0.009
70	33.022	33.0	-0.1	0.009

Table 3: This equipment was connected with temperature probe Model: HP3002.2.5/N, 18021206.
Dimension: Diameter 3.4 mm, Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	33.043	33.0	-0.1	0.009
110	33.043	33.0	-0.1	0.009
110	33.038	33.0	-0.1	0.009
110	33.028	33.0	-0.1	0.009
110	33.022	33.0	-0.1	0.009

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

End of Certificate
NAC
NAC LABORATORY GROUP (THAILAND) CO., LTD.

Certificate of Calibration

Certificate No.: C-01949
Page 2 of 2

Equipment Name: Non-Destructive Moisture Meter
Manufacturer: OTC/OTC
Model: M202.2
Serial No.: 3031431
ID No.: 01949

Customer: A.S. Laboratory Group (Thailand) Co., Ltd.
Address: 104 Pathakarn Rd. Wattana
Bangkok 10000 Thailand
Tel: (66) 02-8680812/13 Fax: (66) 02-8680800

Reference Used During Calibration:
1. Standard Temperature Probe Model: STS-100 A100
Serial No.: 62780-06, Due date: 25 Mar 2022
2. Digital Temperature Indicator Model: DT-1200-A-MK
Serial No.: 871471-Q259, Due date: 04 Jun 2022

Calibration Procedure:
The temperature calibration was done by in-house calibration method using a NIST Class 0.01 standard, in comparison method with standard digital temperature indicator and standard temperature probe. The temperature probe was used based on ITS-90.

Received on: 30 Jun 2022
Calibration done: 17 Jun 2022
Issue date: 17 Jun 2022

Calibration Condition:
Temperature: 23.53 °C
Relative Humidity: 55.415%

REVIEW BY: *[Signature]*
APPROVED BY: *[Signature]*
NEXT CAL DATE: 16/12/25

Calibrated by: M. Somchai Thairasakul
Approved Signature: M. Somchai Thairasakul
Calibration Department Manager

This certificate is valid only for the equipment and conditions stated herein. It is not valid for other equipment or conditions. The certificate is valid only for the equipment and conditions stated herein. It is not valid for other equipment or conditions.

Certificate of Calibration

Certificate No.: C-02249
Page 1 of 2

Equipment Name: Non-Destructive Moisture Meter
Manufacturer: OTC/OTC
Model: M202.2
Serial No.: 3031431
ID No.: 01949

Customer: A.S. Laboratory Group (Thailand) Co., Ltd.
Address: 104 Pathakarn Rd. Wattana
Bangkok 10000 Thailand
Tel: (66) 02-8680812/13 Fax: (66) 02-8680800

Reference Used During Calibration:
1. Standard Temperature Probe Model: STS-100 A100
Serial No.: 62780-06, Due date: 25 Mar 2022
2. Digital Temperature Indicator Model: DT-1200-A-MK
Serial No.: 871471-Q259, Due date: 04 Jun 2022

Calibration Procedure:
The temperature calibration was done by in-house calibration method using a NIST Class 0.01 standard, in comparison method with standard digital temperature indicator and standard temperature probe. The temperature probe was used based on ITS-90.

Received on: 30 Jun 2022
Calibration done: 17 Jun 2022
Issue date: 17 Jun 2022

Calibration Condition:
Temperature: 23.53 °C
Relative Humidity: 55.415%

REVIEW BY: *[Signature]*
APPROVED BY: *[Signature]*
NEXT CAL DATE: 16/12/25

Calibrated by: M. Somchai Thairasakul
Approved Signature: M. Somchai Thairasakul
Calibration Department Manager

This certificate is valid only for the equipment and conditions stated herein. It is not valid for other equipment or conditions. The certificate is valid only for the equipment and conditions stated herein. It is not valid for other equipment or conditions.

63/14-15/6735-36, Soi Pathakarn 7/71, Pathakarn Rd.
Wattana, Bangkok, Bangkok 10000 Thailand
Tel: (66) 02-8680812/13 Fax: (66) 02-8680800 www.prateco.com

Certificate of Calibration

Equipment: pH Meter with Sensor
Manufacturer: Metro Toledo
Model: Seven2Go
Serial No.: 853256371
ID No.: K19, P30420

Submitted by: A.S. Laboratory Group (Thailand) Co., Ltd.
818/10 Moo 5 T. Maenam Kh. A. Phakdang
Rayong 21140 Thailand

Location: PPA On Site Calibration Laboratory

Received on: 11 March 2022
Calibrated on: 13 March 2022
Ambient Temperature: (25 ± 0.2) °C
Relative Humidity: (80 ± 30) %
AC Line Voltage: 220V ± 0.2 V

Calibrated by: M. Somchai Thairasakul
Approved Signature: M. Somchai Thairasakul
Calibration Department Manager

Issue Date: 17 March 2022

The Uncertainty is for a confidence probability of approximately 95%
This certificate is valid only for the equipment and conditions stated herein. It is not valid for other equipment or conditions. The certificate is valid only for the equipment and conditions stated herein. It is not valid for other equipment or conditions.

A 0039307

63/14-15/6735-36, Soi Pathakarn 7/71, Pathakarn Rd.
Wattana, Bangkok, Bangkok 10000 Thailand
Tel: (66) 02-8680812/13 Fax: (66) 02-8680800 www.prateco.com

Certificate of Calibration

Equipment: pH Meter with Sensor
Manufacturer: Metro Toledo
Model: Seven2Go
Serial No.: 853256371
ID No.: K19, P30420

Submitted by: A.S. Laboratory Group (Thailand) Co., Ltd.
818/10 Moo 5 T. Maenam Kh. A. Phakdang
Rayong 21140 Thailand

Location: PPA On Site Calibration Laboratory

Received on: 11 March 2022
Calibrated on: 13 March 2022
Ambient Temperature: (25 ± 0.2) °C
Relative Humidity: (80 ± 30) %
AC Line Voltage: 220V ± 0.2 V

Calibrated by: M. Somchai Thairasakul
Approved Signature: M. Somchai Thairasakul
Calibration Department Manager

Issue Date: 17 March 2022

The Uncertainty is for a confidence probability of approximately 95%
This certificate is valid only for the equipment and conditions stated herein. It is not valid for other equipment or conditions. The certificate is valid only for the equipment and conditions stated herein. It is not valid for other equipment or conditions.

A 1100557

63/14-15/6735-36, Soi Pathakarn 7/71, Pathakarn Rd.
Wattana, Bangkok, Bangkok 10000 Thailand
Tel: (66) 02-8680812/13 Fax: (66) 02-8680800 www.prateco.com

Certificate of Calibration

Equipment: pH Meter
Manufacturer: Metro Toledo
Model: Seven Compact 3220
Serial No.: C104056483
ID No.: K19, P30420

Submitted by: A.S. Laboratory Group (Thailand) Co., Ltd.
818/10 Moo 5 T. Maenam Kh. A. Phakdang
Rayong 21140 Thailand

Location: PPA On Site Calibration Laboratory

Received on: 11 March 2022
Calibrated on: 13 March 2022
Ambient Temperature: (25 ± 0.2) °C
Relative Humidity: (80 ± 30) %
AC Line Voltage: 220V ± 0.2 V

Calibrated by: M. Somchai Thairasakul
Approved Signature: M. Somchai Thairasakul
Calibration Department Manager

Issue Date: 17 March 2022

The Uncertainty is for a confidence probability of approximately 95%
This certificate is valid only for the equipment and conditions stated herein. It is not valid for other equipment or conditions. The certificate is valid only for the equipment and conditions stated herein. It is not valid for other equipment or conditions.

A 0037307



Cert. No.: 22TM1492
Page: 1 of 3

Certificate of Calibration

Equipment: Hot Air Oven
Manufacturer: Memmert
Model: UM 420
Serial No.: 6495-0599
ID No.: RYG_EN0006
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. (Raying Branch)
616/10 Moo 5, T. Maenam Kru, A. Phukdaeng,
Raying 21140, Thailand
Location: Oven Room
Received Order: 20 October 2022
Calibration Date: 20 October 2022
Ambient Temperature: (25 ± 10) °C
Relative Humidity: (50 ± 30) %
Calibrated by: Preecha Hahib
Approved by:
() Ponnthippa Tameyakit
(✓) Malee Buthrua
() Suwit Injai
Issue Date: 2 November 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 0046305



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

Cert. No.: 22TM1492
Page: 2 of 3

Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD).

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument Model Serial No. Cert. No. Due Date
34070A M1405217 21LM30 23 Dec 2022

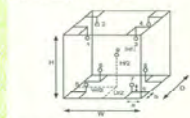
2. This certificate is valid only to the item calibrated on date and place of calibration.

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

Result of Calibration :- (°C) Without Adjustment

Function of UUC :- Temperature Source

Fresh air setting: Close



Probe Installation Details:

a = 50 cm

b = 50 cm

c = 50 cm

Dimension of Chamber:

D = 0.33 m

W = 0.40 m

H = 0.40 m

Capacity = 0.053 m³

Environment during calibration		
	Beginning	Finished
Temp. (°C)	28	29
REL.Humid. (%)	43	47
AC Supply (Vol)	230	221

Position	Ref. Std. ID No.
1	18-10RTD-01
2	18-10RTD-02
3	18-10RTD-03
4	18-10RTD-04
5	18-10RTD-05
6	18-10RTD-06
7	18-10RTD-07
8	18-10RTD-08
9 (ref.)	18-10RTD-09

a 1132473



Equipment: Hot Air Oven
Condition As-Received: Used Item
Reference: 2210-03760C-1
Result of Calibration: (°C) Without Adjustment

Cert. No.: 22TM1492
Page: 3 of 3

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 Factor	Coverage Factor
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 69.998 70.079 70.177 70.664 70.039 70.688 70.149 70.328

Average: The average of 30 values in each position.
Temperature stability: One-half of the greatest maximum difference of measured temperature at any one sensor.
Temperature uniformity: The maximum difference of measured temperature at any sensors and the measured temperature at the reference location which are observed at the same time or at as close in 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 %.

-0-

a 1132472



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

Certificate of Calibration

Equipment: Water Bath
Manufacturer: Memmert
Model: WNR22
Serial No.: LS13-0548
ID No.: RYG_EN0061
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. (Raying Branch)
616/10 Moo 5, T. Maenam Kru, A. Phukdaeng,
Raying 21140, Thailand
Location: Wet Chemistry Lab
Received Order: 20 October 2022
Calibration Date: 20 October 2022
Ambient Temperature: (25 ± 10) °C
Relative Humidity: (50 ± 30) %
Calibrated by: Preecha Hahib
Approved by:
() Ponnthippa Tameyakit
(✓) Malee Buthrua
() 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, along with the prior written
Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services

a 0046306



Equipment: Water Bath
Condition As-Received: Used Item
Reference: 2210-03760C-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 (IRPT).

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
34070A M1405217 21LM30 23 Dec 2022

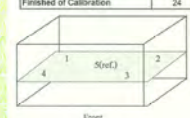
2. This certificate is valid only to the item calibrated on date and place of calibration.

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

Result of Calibration :- (°C) Without Adjustment

Function of UUC :- Temperature Source

		Environmental (°C)	AC Voltage Supply (Vol)
Beginning of Calibration	24	53	222
Finished of Calibration	24	50	221



Front

Position	Ref. Std. S/N
1	N37P300728
2	N37P300727
3	N37P300728
4	N37P300729
5 (ref.)	N37P300730

a 1132471



Equipment: Water Bath
Condition As-Received: Used Item
Reference: 2210-03760C-4
Result of Calibration: (°C) Without Adjustment

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

Function of UUC :-

Temperature Source

Calibration point (°C)	UUC Setting (°C)	UUC Reading (°C)	Average Standard Reading (°C)				
85.0	85.0	85.0	84.527	84.563	84.628	84.516	84.580

Calibration point (°C) UUC Setting (°C) UUC Reading (°C) Stability (± °C) Uniformity (± °C) Coverage Factor
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 in 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 of 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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a 1132470



Cert. No.: 22TW34
Page: 1 of 2

Certificate of Testing

Equipment: DO Meter
Manufacturer: YSI
Model: 5000-115V
Serial No.: 15E102796
ID No.: RYG_EN0032
Received Date: 11 February 2022
Test Date: 14 February 2022
Reference: 2022-04029C-4
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. (Raying Branch)
616/10 Moo 5, T. Maenam Kru, A. Phukdaeng,
Raying 21140, Thailand
Laboratory Condition: Temperature (25 ± 5) °C
Humidity (50 ± 20) %
Test Procedure: In-house method: CP-019
by Comparison Technique with Azido Modification Method
Tested by: Watsak Sirthean
Approved by:
() Malee Buthrua
(✓) Sathip Meekong
() Warahom Lenggrakul
Issue Date: 18 February 2022

a 0281285



Result: Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 15E100464

Cert. No.: 22TW34
Page: 2 of 2

Titration Method (Azido Modification Method) (mg/L)	DC Meter Reading (mg/L)	Standard Deviation (mg/L)
6.02	1.02	0.0094

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 prevent 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.

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a 1084744



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. (Raying Branch)
616/10 Moo 5, T. Maenam Kru, A. Phukdaeng,
Raying 21140, Thailand
Location: TPA On Site Calibration Laboratory
Received Order: 11 February 2022
Calibrated Date: 21 February 2022
Ambient Temperature: (25 ± 10) °C
Relative Humidity: (50 ± 30) %
AC Line Voltage: 220 ± 22 V
Calibrated by: Kunsit Promrat
Approved by:
() Ponnthippa Tameyakit
(✓) Malee Buthrua
() Suwit Injai
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 : 2204-0146OC-6
Cert. No.: 2213112
Page: 2 of 2

Procedure Used :
 Calibration was 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:
 1) Digital Thermometer
 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, SN: 15E100434

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (°C)	Coverage Factor k
20.00	45	20.001	19.99	-0.121	±1.5	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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a 1055114

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND) JAPAN
 COOPERATION AGREEMENT FOR EQUIPMENT CALIBRATION AND TESTING SERVICES
 1044 PATTANASIRI ROAD 104/105, BANGKOK 10110, THAILAND
 TEL. 0 2717 8461-2 FAX. 0 2717 8131

Certificate of Calibration
Cert. No.: 2213117
Page: 1 of 3

Equipment : Low Temp. Incubator
Manufacturer : Memmert
Model : IPP750
Serial No. : V816.0084
ID No. : RY6_END154
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd.
 (Rayong Branch)
 616/10 Moo 5 T. Maenam Khu,
 A. Phakdaeng, Rayong 21140, Thailand
Location : BOO Room
Received Order : 22 April 2022
Calibration Date : 22 April 2022
Ambient Temperature : (26 ± 1) °C
Relative Humidity : (50 ± 3) %
Calibrated by : Man Patisapongsookun

Approved by : 
 Approved Signatory
☐ Punditip Tanayakul
☒ Malee Butnua
☐ Suwit Injai

Issue Date : 3 May 2022
 The Uncertainty are for a confidence probability of approximately 95 %.

This certificate may not be reproduced without the prior written approval of the Board of Corporate Services & Equipment Calibration and Testing Services.

A 0040735

Equipment : Low Temp. Incubator
Condition As-Received : Used Item
Reference : 2204-0146OC-1
Cert. No.: 2213117
Page: 2 of 3

Procedure Used :
 Calibration was conducted using calibration procedure CP-OT02 according to direct measurement.
 The temperature scale used was based on ITS-90.

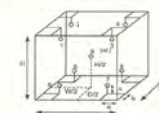
Condition of this result of calibration
 1. Reference standard instrument:
 Instrument: Model: Serial No.: Cert. No.: Due Date:
 1) Data: PHS20001: 3407014: M744031708: 2113112: 02 Sep 2022
 2. This certificate is valid only to the item calibrated on date and place of calibration.
 3. This certificate 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. (°C)	25	25
Rel. Humid. (%)	54	56
AC Supply (Voh)	221	223

Probe installation Details



Dimension of Chamber :
 a = 10 cm D = 0.60 m
 b = 10 cm W = 1.0 m
 c = 10 cm H = 1.2 m
 Capacity = 0.75 m³

Position :

Position	Ref. Std. ID No.
1	WRTO-21
2	WRTO-22
3	WRTO-23
4	WRTO-24
5	WRTO-25
6	WRTO-26
7	WRTO-27
8	WRTO-28
9 (ref.)	WRTO-29

a 1106495

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

Cert. No.: 2213017
Page: 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (± °C)	Overall Variation (± °C)	Uncertainty (± °C)	Coverage Factor k
20.0	20.0	20.0	0.022	0.20	0.22	0.30	2

Measured Temperature (°C)

Calibration Point (°C)	Position								
	1	2	3	4	5	6	7	8	9 (ref.)
20.0	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.
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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a 1106484

ภาคผนวก จ

สำเนาหนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

ที่ อก ๐๓๑๐(๑)/ ๑๐๖๙



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ เขตราชเทวี
กรุงเทพมหานคร ๑๐๔๐๐

๒๘ มกราคม ๒๕๖๕

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๓๐ กรกฎาคม ๒๕๖๓

- สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น
๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ แผ่น
๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุ
หนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔
ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร
ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย)
จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

- ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย ตามสิ่งที่ส่งมาด้วย ๑
ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๖๒ ราย ตามสิ่งที่ส่งมาด้วย ๒
ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๕๙ รายการ น้ำใต้ดิน
จำนวน ๑๒๖ รายการ อากาศเสีย ๑๖ รายการ สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน ๓๕ รายการ และดิน
จำนวน ๑๒๕ รายการ รวมทั้งสิ้นจำนวน ๓๖๑ รายการ ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ กันยายน ๒๕๖๖ หากประสงค์จะต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอ
ต่อกรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์
เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศิริะ จันทรเจต)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๒๐๒ ๔๑๔๖ ๐ ๒๒๐๒ ๔๐๐๒

โทรสาร ๐ ๒๓๕๔ ๓๒๐๘ ๐ ๒๓๕๔ ๓๔๑๕

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย

๑) นางสาวยุพาพร จันทร์เปล่ง

ทะเบียนเลขที่ ว-๒๐๔-ค-๔๗๐๐

๒) นางสาวชัชชัย โกมารกุล ณ นคร

ทะเบียนเลขที่ ว-๒๐๔-ค-๔๗๐๑

๓) นายศรายุทธ จิตรานนท์

ทะเบียนเลขที่ ว-๒๐๔-ค-๔๗๐๒

๔) นางสาวกนกกร เอนก

ทะเบียนเลขที่ ว-๒๐๔-ค-๖๑๑๑

๕) นายสุริยา สอนแก้ว

ทะเบียนเลขที่ ว-๒๐๔-ค-๖๑๑๒

๖) นายวิชาญ ชูณหะวัณ

ทะเบียนเลขที่ ว-๒๐๔-ค-๖๑๑๓



(นายศิริระ จันทร์เจิด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/ ๑๐๖๙

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๖๒ ราย

๑) นางสาวจินดา ไชจุลธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๐๘
๒) นางสาวสาวิตรี น้อยเสงี่ยม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๐๙
๓) นางสาวชนัญญาญจน์ อัมมขม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๐
๔) นางสาวนรินทร์ สายเส็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๕
๕) นางสาวนันทวดี สมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๖
๖) นางสาวศรัณยา เฉลิมธำรงค์	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๗
๗) นางสาวสรารักษ์ มงคลจิรวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๙
๘) นางสาวศิริลักษณ์ พึ่งแพง	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๒๐
๙) นายณพพงศ์ จันทรพันธุ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๐๘
๑๐) นายนรเศรษฐ์ โกมาลย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๑
๑๑) นายธันวา จรียา	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๔
๑๒) นางสาวเกศรินทร์ แก้วมัน	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๖
๑๓) นางสาวสุวิมล ชัยเรืองวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๗
๑๔) นางสาวสุชาดา ธรรมถาวร	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๑
๑๕) นางสาวเบมิกา ชัยเดชธนกุล	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๓
๑๖) นางสาวศศิธร หมูสวัสดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๔
๑๗) นางสาวเสาวลักษณ์ ภู่นภาอำพร	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๕
๑๘) นายอภิสิทธิ์ สิงหา	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๖
๑๙) นายศักดิ์สิทธิ์ ไพศาลพิสุทธิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๗
๒๐) ว่าที่ร้อยตรีหญิง พรรณิภา ขำเจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๘
๒๑) นางจิตดา คำภูแก้ว	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๓๑
๒๒) นางสาวอรรพรรณ รักยง	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๑๕
๒๓) นางสาวนพรัตน์ แยมกรานต์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๑๙
๒๔) นายจุลเดช วารินทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๐
๒๕) นางสาวดาญรัตน์ ร้องคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๑
๒๖) นายนคร สุขเจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๒
๒๗) นายบัญชา นามเขตต์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๓
๒๘) นายพรมมี ศรีปัตเนตร	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๕
๒๙) นายอุทิศ อุ่นสิม	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๖
๓๐) ว่าที่ร้อยตรี เฉลิมเกียรติ อมรศรีเสริม	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๘
๓๑) นางสาววริยา สร้างนา	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๙
๓๒) นายอนุพงศ์ รัตนศรีประเสริฐ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๓๐
๓๓) นางสาวจุฑารัตน์ โอนสันเทียะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๔๒
๓๔) นางสาวจรรววรรณ พิมพ์อริกฤติยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๗๖

(นายศิระ จันทรเจ็ด)

๓๕) นางสาวปรารค์ทิพย์...

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

สำนักงานคณะกรรมการอาหารและยา

๓๕) นางสาวปรางค์ทิพย์ กิจไพศาลศักดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๗๙
๓๖) นางสาวเดือนใจ ทางกลาง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๐
๓๗) นางสาวจิราพร ศิริเวช	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๑
๓๘) นายวรกร ผูกרך	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๒
๓๙) นายทอง วิริยะสทกิจ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๓
๔๐) นายธนิต เจนจบ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๔
๔๑) นายคณิศร ขำเพชร	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๕
๔๒) นายอรรคพล นิยมวิทยาพันธ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๖
๔๓) นายภูวิช พรหมสะอาด	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๗
๔๔) นายธนเดช โภคาพิพัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๘
๔๕) นายชวฤทธิ์ วงษ์จันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๙
๔๖) นายอาทิตย์ ศรีแสน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๐
๔๗) นายเจษฎินทร์ คงศักดิ์ไทย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๑
๔๘) นายจรัส บุญยั้ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๒
๔๙) นายธนาณัติ เอนก	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๓
๕๐) นายอภิวัฒน์ ทุมหนู	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๔
๕๑) นางสาวสุภาขวัญ มาก	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๕
๕๒) นางสาวหัตถพร ขวาลสมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๐
๕๓) นางสาวธิดิมา บุญเพ็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๑
๕๔) นางสาวกนกอร เข้มเพ็ชร	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๒
๕๕) นางสาวพัชรียา หงษ์สมดี	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๓
๕๖) นางสาวภาวนิดา สุรวงศ์ตระกูล	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๔
๕๗) นางสาวภาณุมาศ นามวัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๕
๕๘) นางสาวอุไรรัตน์ ทิงสร้างแป้น	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๖
๕๙) นายธีรวัฒน์ ปวงสุข	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๗
๖๐) นายอิทธิพล ยะโส	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๘
๖๑) นายประพจน์ วรรณชูชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๙
๖๒) นายชยธร พวงทิพย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๐
๖๓) นางสาวกนกวรรณ จันทบาล	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๑
๖๔) นางสาวเกษร หลักบุญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๒
๖๕) นายสิทธิโชค ธงเงิน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๓
๖๖) นางศิลปวรรณ ใจบุญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๕
๖๗) นางสาวพรรณธิดา พุ่มคง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๘
๖๘) นางสาวศรณีย์ ยิ่งดี	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๙
๖๙) นายนวกัทร ศรีวิริยะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๐
๗๐) นายสุวิชา ทองอ่อน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๑
๗๑) นายวิญญู บุญตะนัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๓

(นายศิริระ จันทรเจ็ด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

กระทรวงอุตสาหกรรม

๗๒) นายสมบูรณ์...

๑๐๙) นายพนนพชัย อุปถัมภ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๔
๑๑๐) นายนิรุฬพล คุณสุทธิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๕
๑๑๑) นายนิพนธ์วัฒน์ สาริน	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๖
๑๑๒) นายปิยะนัฐ พลมะศรี	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๗
๑๑๓) นายพงศ์สิริ โสมเขียว	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๘
๑๑๔) นายพีรพัฒน์ กำคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๙
๑๑๕) นายภาณุพงศ์ มานิตย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๐
๑๑๖) นายมงคล ผลาทิพย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๑
๑๑๗) นายมนูรินทร์ พูลศิริ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๒
๑๑๘) นายสิรินันท์ ทองอ้น	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๓
๑๑๙) นายอเนชา ทันสมัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๔
๑๒๐) นายอดิศักดิ์ ผมไผ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๕
๑๒๑) นายอนันตชัย วิสุม	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๖
๑๒๒) นายณัฐดนัย เจือละออง	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๗
๑๒๓) นายวรวิธ คีนิก	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๘
๑๒๔) นายแสงตะวัน นະตะສັດ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๙
๑๒๕) นายยุทธพงศ์ รัตนะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๐
๑๒๖) นายชัยวัฒน์ ไซยะนิจ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๑
๑๒๗) นายวิศรุต ศรีธรรมมา	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๒
๑๒๘) นายพนนทกร เผือกผ่อง	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๓
๑๒๙) นายกำชัย สุทธะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๔
๑๓๐) นางสาวณัฐภรณ์ รักทะเล	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๑๙
๑๓๑) นางสาวประภาภรณ์ บุตรพรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๐
๑๓๒) นางสาวนิลาวัลย์ นามพรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๑
๑๓๓) นางสาวพัชรินทร์ แสนสร้อย	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๒
๑๓๔) นายไพโรจน์ เปี่ยมพิมาย	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๓
๑๓๕) นางสาวศุภมาศ ทองมาก	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๔
๑๓๖) นางสาวลลิตา จิตรสว่าง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๕
๑๓๗) นางสาวชไมพร เสิกภูเขียว	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๖
๑๓๘) นางสาวกฤติมาพร คำมีแก่น	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๗
๑๓๙) นางสาวสกลรัตน์ ภาควุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๘
๑๔๐) นางสาวกาญจนา คงคุณ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๙
๑๔๑) นางสาวไพรินทร์ ศรีรูปี	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๐
๑๔๒) นางสาวทิพนันดา ฝูญปัญญา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๑
๑๔๓) นางสาวสาธิตา ปานทอง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๒
๑๔๔) นางสาวอริสา ทองนวล	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๓
๑๔๕) นางสาวอริยา คำคล่อง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๔

(นายศิริ จันทรเจ็ด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

๑๔๖) นางสาวบุษดาภรณ์...

๑๔๖) นางสาวชุตานกรณ์ สุนทรสนาน	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๕
๑๔๗) นางสาวสุดารัตน์ นนทประสาท	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๖
๑๔๘) นางสาวรัชนิกร เนียมกลาง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๗
๑๔๙) นางสาวกัญญารัตน์ ศรีนิลทา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๘
๑๕๐) นางสาวอัญชลี คำจันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๙
๑๕๑) นายบุญฤทธิ์ เอี่ยมเทศ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๐
๑๕๒) นายศิริวัฒน์ พานิชย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๑
๑๕๓) นางสาวศุภรดา ปันมยุรา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๒
๑๕๔) นางสาวพาฤดี คุณนาน	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๓
๑๕๕) นางสาวจิราเจต พองดา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๔
๑๕๖) นางสาวกนกภรณ์ อุระ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๕
๑๕๗) นางสาวอารยา มีชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๖
๑๕๘) นางสาวจิตสุภา ประเทืองสุข	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๗
๑๕๙) นางสาวอริสา วิริยขันติธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๘
๑๖๐) นางสาววิษุตา นาคผจญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๙
๑๖๑) นางสาวพนิดา ยอดอินทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๕๐
๑๖๒) นางสาวนันทิยา จันทะสุน	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๕๑



(นายศิริระ จันทรเจติ)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/ ๑๐๖๕

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๖๑ รายการ

น้ำเสีย จำนวน 59 รายการ

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

(นางริกาญจน์ จิตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

19 Copper...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
19	Copper	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
20	Cyanide	Distillation, Colorimetric Method ^[4]
21	2,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
22	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
23	2,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
24	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
25	2,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
26	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
27	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
28	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
29	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
30	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
31	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
32	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
33	Formaldehyde	Distillation, Colorimetric Method ^[3]
34	Free Chlorine	1) DPD Ferrous Titrimetric Method ^[4] 2) Iodometric Method ^[4]
35	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
36	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
37	Hexavalent Chromium	Filtration, Colorimetric Method ^[4]
38	3-Hydroxycarbofuran	High-Performance Liquid Chromatographic Method ^[4]
39	Lead	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
40	Manganese	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
41	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma/Mass spectrometric Method ^[4]
42	Methiocarb	High-Performance Liquid Chromatographic Method ^[4]
43	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]

วิมล

44 Methomyl...

(นางริกาญจน์ อัครสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

กรมส่งเสริมการค้าระหว่างประเทศ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
44	Methomyl	High-Performance Liquid Chromatographic Method ^[4]
45	Nickel	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
46	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method ^[4] 2) Soxhlet Extraction Method ^[4]
47	Oxamyl	High-Performance Liquid Chromatographic Method ^[4]
48	Propoxur	High-Performance Liquid Chromatographic Method ^[4]
49	pH	Electrometric Method ^[4]
50	Phenols	1) Distillation, Chloroform Extraction Method ^[4] 2) Distillation, Direct Photometric Method ^[4]
51	Selenium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
52	Sulfide	Iodometric Method ^[4]
53	Temperature	Laboratory and Field Methods ^[4]
54	Total Dissolved Solids	Dried at 180 °C ^[4]
55	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method ^[4]
56	Total Suspended Solids	Dried at 103-105 °C ^[4]
57	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
58	Trivalent Chromium	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ^[4]
59	Zinc	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[4]

น้ำใต้ดิน จำนวน 126 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]

วิมล

3 Aldrin...

(นางริภาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

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

วิธีทาง)

18 Bis(2-ethylhexyl)phthalate...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4] Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^[4]
22	Butyl Benzyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
27	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]

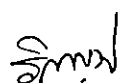


34 Chromium (III)...

(นางริกาญจน์ จิตรสกุลไธ)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

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



(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

68 Fluorene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
69	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
70	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
74	α -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
75	β -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
76	γ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
81	Lead	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
83	Mercury	1) Cold Vapor Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]

ร.พ.ว.

84 Methanol...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

แบบฟอร์มแจ้งผลการวิเคราะห์

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4] 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^[4]
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
95	N-Nitrosodi-n-Propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB 1242 - PCB 1248 - PCB 1254 - PCB 1260	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]

วิมล

97 Pentachlorophenol...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
98	pH	Electrometric Method ^[4]
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
100	Phenol	1) Distillation, Direct Photometric Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
102	Selenium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
103	Silver	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
104	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
105	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
106	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
107	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
108	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
109	TPH (C ₅ -C ₉)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,24]
110	TPH (C ₈ -C ₁₆)	Solvent Extraction, Gas Chromatographic Method ^[9,21]
111	TPH (C ₁₆ -C ₃₅)	Solvent Extraction, Gas Chromatographic Method ^[9,21]
112	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
113	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]

วิมล

114 1,1,2-Trichloroethane...

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

อากาศเสีย (ปล่อยระบาย) จำนวน 16 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
2	Arsenic	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]

วิฑูรย์

3 Carbon Monoxide...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และหน่วยงานที่เกี่ยวข้อง

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
3	Carbon Monoxide	1) Sampling Bag Non-Dispersive Infrared Method ^[5] 2) Non-Dispersive Infrared Method ^[5] 3) Instrumental Analyzer Method ^[5]
4	Chlorine	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
5	Copper	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
6	Dioxins	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory or Analysis by Department of Industrial Works Registered Laboratory (Dioxins/Furans Analysis Approved) ^[5]
7	Hydrogen Chloride	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
8	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[5]
9	Lead	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
10	Mercury	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[5] 2) Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
11	Opacity	Ringelmann's Method ^[2]
12	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ^[5] 2) Chemiluminescence Method ^[5] 3) Instrumental Analyzer Method ^[5]
13	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ^[5] 2) UV Fluorescence Method ^[5] 3) Instrumental Analyzer Method ^[5]
14	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ^[5]
15	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[5]
16	Xylene	Adsorption Sampling, Gas Chromatographic Method ^[5]

วิมล

สิ่งปลูก...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิชาการวิเคราะห์ทดสอบมลพิษ

กรมควบคุมมลพิษ

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]



6 Cadmium...

(นางริกาญจน์ จิตรสกุลใจ)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,19,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
9	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method ^[1,6,15,17] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method ^[1,6,16,17] 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8,15,17] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8, 16,17]
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^[1,6,17] 2) Alkaline Digestion, Colorimetric Method ^[8,17]



(นางริกาญจน์ จิตรสกุลวิไล)

11 Cobalt...

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

.....เรียน...../.....

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25]

จิราพร

2) Soxhlet...

(นางริกาญจน์ จัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31] 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25]
18	Endrin	2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31] 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25]
19	Heptachlor	2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31] 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25]
20	Lead	2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31] 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[1,6,18]

วิมล

2) Waste Extraction...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
23	Methoxychlor	2) Waste Extraction, Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ^[1,6,19] 3) Waste Extraction, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^[1,6,20] 4) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[18] 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ^[19] 6) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^[20]
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
25	Molybdenum	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
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]
		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]

วิภากร

27 Polychlorinated...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	<p>Polychlorinated biphenyls (PCBs)</p> <ul style="list-style-type: none"> - 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 	<p>1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method^[1,9,23]</p> <p>2) Soxhlet Extraction, Gas Chromatographic Method^[10,23]</p> <p>3) Automated Soxhlet Extraction, Gas Chromatographic Method^[22,31]</p>

วิมล

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

28 Pentachlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
29	pH	Electrometric Method ^[29,30]
30	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16]
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15]

วิมล

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิชาการวิเคราะห์ทดสอบมลพิษ

4) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
35	Zinc	4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16] 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]

ดิน จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
4	Anthracene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
8	Barium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]

วิมล

(นางริกาณจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

9 Benz(a)anthracene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
9	Benz(a)anthracene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
11	Benzo(b)fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
12	Benzo(k)fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
13	Benzoic acid	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
14	Benzo(a)pyrene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
15	Benzo(g,h,i)perylene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
17	Bis(2-chloroethyl)ether	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
18	Bis(2-ethylhexyl)phthalate	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
21	Butanol	Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^[12,24]
22	Butyl Benzyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
24	Carbazole	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]

วิกรม

26 Carbon tetrachloride...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
28	p-Chloroaniline	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
32	2-Chlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8,15,17] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8,16,17]
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^[8,17]
36	Chrysene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
37	Cyanide	Extraction, Distillation, Colorimetric Method ^[26,27,28]
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
39	DDD	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]

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]

วิภาณี

57 Dieldrin...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
58	Diethyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
59	2,4-Dimethylphenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
60	2,4-Dinitrophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
61	2,4-Dinitrotoluene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
62	2,6-Dinitrotoluene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
63	Di-n-Octyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
67	Fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
68	Fluorene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
70	Heptachlor Epoxide	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
73	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
74	α -HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
75	β -HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
76	γ -HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
77	Hexachlorocyclopentadiene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
78	Hexachloroethane	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
79	Indeno(1,2,3-cd)pyrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
80	Isophorone	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
81	Lead	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[18]



(นางริกาญจน์ จัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และหน่วยงานบังคับปฏิบัติการ

2) Thermal...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry ^[19] 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^[20] Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^[12,24]
85	Methoxychlor	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
88	2-methylphenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
89	2-Methylnaphthalene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
91	Naphthalene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
93	Nitrobenzene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
94	N-Nitrosodiphenylamine	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
95	N-Nitrosodi-n-propylamine	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,23] 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^[23,32]

วิฑูรย์

(นางริกาญจน์ ฉัตรสกุลวิไล)

- Aroclor 1242...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
	<ul style="list-style-type: none"> - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4',6-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5',6-Heptachlorobiphenyl - 2,2',3,4',5,5',6-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl 	
97	Pentachlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
98	Phenanthrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
99	Phenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
100	Pyrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
101	Selenium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
102	Silver	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
103	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
108	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
109	TPH (C ₈ - C ₁₆)	1) Solvent Extraction, Gas Chromatographic Method ^[11,21] 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^[21,31]
110	TPH (C ₁₆ - C ₃₅)	1) Solvent Extraction, Gas Chromatographic Method ^[11,21] 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^[21,31]
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
115	2,4,5-Trichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]

วิมล

116 2,4,6-Trichlorophenol...

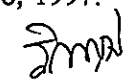
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ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

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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(นางริกาญจน์ ฉัตรสกุลไธ)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ



ที่ อก ๐๓๑๐(๓)/ ๖๔๗๐

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๘ มิถุนายน ๒๕๖๕

เรื่อง ขันทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลборาทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๙ เมษายน ๒๕๖๔

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลборาทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๒ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลборาทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอขึ้นทะเบียน
ห้องปฏิบัติการวิเคราะห์เอกชน พร้อมรายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ เจ้าหน้าที่ประจำ
ห้องปฏิบัติการวิเคราะห์ และรายการสารมลพิษที่จะทำการวิเคราะห์ ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลборาทอรี กรุ๊ป
(ประเทศไทย) จำกัด ขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน มีเลขทะเบียน ว-๓๒๓ สถานที่ตั้งเลขที่
๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่น้ำคู้ อำเภอลวกแดง จังหวัดระยอง โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

- | | | |
|--------------------------|---------------|--------------|
| ๑) นายเดช ช้างชน | ทะเบียนเลขที่ | ว-๓๒๓-ค-๙๔๔๒ |
| ๒) นางวิลาวัลย์ บริรักษ์ | ทะเบียนเลขที่ | ว-๓๒๓-ค-๙๔๔๓ |
| ๓) นายสุพจน์ สลามเต๊ะ | ทะเบียนเลขที่ | ว-๓๒๓-ค-๙๔๔๔ |

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

- | | | |
|---------------------------------|---------------|--------------|
| ๑) นางสาวนฤมล บรรจงกิจ | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๔๕ |
| ๒) นางพจนา สีดา | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๔๖ |
| ๓) นางสาวธนิดา กุลสุริวงศ์ | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๔๗ |
| ๔) นายพิทยา ทองแดง | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๔๘ |
| ๕) นางชลธิชา สุนงข | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๔๙ |
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| ๗) นายวรารุณ ทัพพา | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๕๑ |
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| ๙) นายสุรศักดิ์ สาชิน | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๕๓ |
| ๑๐) นางสาวเพชรคุณ ภาภูตานนท์ | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๕๔ |
| ๑๑) นายสถาพร ภาแก้ว | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๕๕ |
| ๑๒) นายสุทธิดำรงค์ โชคปิตินันท์ | ทะเบียนเลขที่ | ว-๓๒๓-จ-๙๔๕๖ |

๑๓) นายวัลลภ หันไชยเนาว์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๕๗
๑๔) นางสาววนาลี เหมยญตระกูล	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๕๘
๑๕) นางสาวนิดา ผดุงจิตต์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๕๙
๑๖) นายธนะสิทธิ์ วงศ์ไชย	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๐
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๑๘) นายสัจจา เพ็ชรแสง	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๒
๑๙) นายกันตภณ มณีสัมพันธ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๓
๒๐) นางสาวจันทนีย์ โกเมนชนะ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๔
๒๑) นายธารินทร์ อ็อกจินดา	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๕
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๒๕) นายไสว ตันโพธิ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๖๙
๒๖) นางสาวกิตติยา สัญญาอริยาภรณ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๐
๒๗) นางสาวเจษฎาพร ศรีบุญเรือง	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๑
๒๘) นางสาวมธุรินทร์ สิงห์เงา	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๒
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๓๑) นายศิริวิทย์ เรืองสม	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๕
๓๒) นายปารามศ สัตยาคุณ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๖
๓๓) นายนฤนาท ธรรมสโร	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๗
๓๔) นางสาวศุภรัตน์ โสจันทร์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๘
๓๕) นายพชรกร อินทรเสนา	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๗๙
๓๖) นายทิวากร เชื้อมาก	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๐
๓๗) นายอนุรักษ์ ทองขจรศักดิ์	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๑
๓๘) นายอภิชาติ วิลาศ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๒
๓๙) นายจรัสระวี ศรีรักษา	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๓
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๔๒) นายสันติ ชัยชนะ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๖
๔๓) นายสิทธิชัย แก้วเกตุ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๗
๔๔) นายทินกร กุลชาติ	ทะเบียนเลขที่	ว-๓๒๓-จ-๙๔๘๘

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๑๔ รายการ
 อากาศเสีย (ปล่องระบาย) จำนวน ๗ รายการ และน้ำใต้ดิน จำนวน ๓ รายการ รวมทั้งสิ้นจำนวน ๒๔ รายการ
 ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้มีอายุ ๓ ปี นับจากวันที่กรมโรงงานอุตสาหกรรมออกหนังสือ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



(นางจินดา เตชะศรีนทร์)

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

๒๘ มิ.ย. ๒๕๖๔

กองวิจัยและเตือนภัยมลพิษโรงงาน

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

โทร. ๐ ๓๘๐๕ ๗๒๖๑-๓

ไปรษณีย์อิเล็กทรอนิกส์ eirw@diw.mail.go.th

เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๓๒๓

ที่ ออก ๐๓๑๐(๓)/

๖๔๗๐

ลงวันที่

๒๘

มิถุนายน

๒๕๖๔

ขอขยาสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๔ รายการ
น้ำเสีย จำนวน 14 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Biochemical Oxygen Demand	1) 5-Day BOD Test, Membrane Electrode Method ^[2] 2) 5-Day BOD Test, Azide Modification Method ^[2]
2	Chemical Oxygen Demand	1) Open Reflux, Titrimetric Method ^[2] 2) Closed Reflux, Colorimetric Method ^[2] 3) Closed Reflux, Titrimetric Method ^[2]
3	Color	ADMI Weighted – Ordinate Spectrophotometric Method ^[2]
4	Cyanide	Distillation, Colorimetric Method ^[2]
5	Formaldehyde	Distillation, Colorimetric Method ^[1]
6	Free Chlorine	DPD-Ferrous Titrimetric Method ^[2]
7	Oil and Grease	Liquid-Liquid Partition-Gravimetric Method ^[2]
8	pH	Electrometric Method ^[2]
9	Phenols	1) Distillation, Chloroform Extraction Method ^[2] 2) Distillation, Direct Photometric Method ^[2]
10	Sulfide	ZnS Precipitation, Iodometric Method ^[2]
11	Temperature	Laboratory and Field Method ^[2]
12	Total Dissolved Solids	Dried at 180 °C ^[2]
13	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method ^[2]
14	Total Suspended Solids	Dried at 103-105 °C ^[2]

อากาศเสีย (ปล่อยระบาย) จำนวน 7 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Carbon Monoxide	1) Sampling Bag, Non-Dispersive Infrared Method ^[5] 2) Instrumental Analyzer Method ^[8]
2	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[5]
3	Opacity	Ringelmann's Method ^[3,4]
4	Oxide of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ^[6] 2) Instrumental Analyzer Method ^[9]
5	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ^[5] 2) Instrumental Analyzer Method ^[10]

วิภา สัมฤทธิ์ผล

(นางสาววิชุดา สัมฤทธิ์ผล)

ผู้อำนวยการ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

Sulfuric Acid...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Sulfuric Acid	Isokinetic Sampling, Barium – Thorin Titrimetric Method ^[6]
7	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[7]

น้ำใต้ดิน จำนวน 3 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method ^[2]
2	pH	Electrometric Method ^[2]
3	Phenols	Distillation, Direct Photometric Method ^[2]

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วิภา สัมฤทธิ์ผล

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ผู้อำนวยการ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก



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