

ภาคผนวก ค

ใบรับรองผลการตรวจวิเคราะห์



Analysis / Test Report

Client : BASF (Thai) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Pluakdaeng, Amphur
Pluakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136511
Date Received :Dec 09, 2024
Date Reported :Dec 18, 2024
Report Number :3181469-1

Page 1 of 1

Sample Number	24136511-1							
Sample Description	Emission from Stationary Source							
Location	Boiler Stack							
Measurement Date	Dec 09, 2024							
Stack Description								
Ambient Temperature	31.8	°C	Diameter	0.49	m	Oxygen	7.02	%
Ambient Pressure	751.2	mmHg	Shape	Circle		Carbon dioxide	8.03	%
Type of Process	Combustion		Stack Temperature	131	°C	Gas Velocity	2.57	m/s
Type of Fuel	Natural Gas		Moisture	12.64	%	Flow Rate	1112	Nm3/hr
Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm) at Actual O ₂ at 7% O ₂		Nitrogen Dioxide (ppm) at Actual O ₂ at 7% O ₂		
1	12:55 PM - 01:15 PM	6.94	8.07	68.17	67.88	0.87	0.87	
2	01:16 PM - 01:36 PM	7.04	8.02	68.21	68.40	1.03	1.04	
3	01:37 PM - 01:57 PM	7.08	7.99	68.84	69.26	1.05	1.06	
Average (ppm)		7.02	8.03	68.40	68.51	0.99	0.99	
Guideline (ppm)					200	-	-	
Result (mg/Nm ³)				128.69	128.90	1.85	1.86	
Emission Rate at Actual O ₂ (g/s)				0.0398		0.0006		
Method				US EPA Method 7E		US EPA Method 10		

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

Technical Management

Wichan Choonharat
Wichan Choonharat
Manager
ทะเบียนเลขที่ 7-204-น-0006

Approved by

Sarayuth Jitranont
Sarayuth Jitranont
Assistant General Manager
ทะเบียนเลขที่ 7-204-น-0003

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Analysis / Test Report

Client : BASF (Thai) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Pluakdaeng, Amphur
Pluakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136517
Date Received :Dec 09, 2024
Date Reported :Dec 18, 2024
Report Number :3181478-1

Page 1 of 1

Sample Number	24136517-1							
Sample Description	Emission from Stationary Source							
Location	Scrubber Stack							
Measurement Date	Dec 09, 2024							
Stack Description								
Ambient Temperature	31.8	°C	Diameter	1.59	m	Oxygen	20.02	%
Ambient Pressure	751.2	mmHg	Shape	Circle		Carbon dioxide	0.33	%
Type of Process	Process		Stack Temperature	47	°C	Gas Velocity	11.97	m/s
Type of Fuel	-		Moisture	13.72	%	Flow Rate	67982	Nm3/hr
Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm) at Actual O ₂ at 7% O ₂		Nitrogen Dioxide (ppm) at Actual O ₂ at 7% O ₂		
1	10:55 AM - 11:15 AM	19.78	0.52	2.13	26.39	0.34	4.25	
2	11:16 AM - 11:36 AM	20.04	0.26	2.03	32.98	0.26	4.29	
3	11:37 AM - 11:57 AM	20.23	0.19	1.99	41.01	0.21	4.42	
Average (ppm)		20.02	0.33	2.05	33.46	0.27	4.32	
Guideline (ppm)				-	-	-	-	
Result (mg/Nm ³)				3.85	62.95	0.52	8.13	
Emission Rate at Actual O ₂ (g/s)				0.0728		0.0097		
Method				US EPA Method 7E		US EPA Method 10		

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

Technical Management

Wichan Choonharat
Wichan Choonharat
Manager
ทะเบียนเลขที่ 7-204-น-0006

Approved by

Sarayuth Jitranont
Sarayuth Jitranont
Assistant General Manager
ทะเบียนเลขที่ 7-204-น-0003

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Analysis / Test Report

Client : BASF (Thai) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Pluakdaeng, Amphur
Pluakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136518
Date Received : Dec 09, 2024
Date Reported : Dec 21, 2024
Report Number: 3181484-2

Page 1 of 1

Sample Number	24136518-1							
Sampled Date	Dec 09, 2024							
Sample Description	Emission from Stationary Source							
Location	Scrubber Stack							
Date Analysis Commenced	Dec 10, 2024							
Condition of Sample	Extracted into one filter paper placed in plastic petri dish, one 10-L air sampling bag and two sorbent tubes, refrigerated							
Stack Description								
Ambient Pressure	751	mmHg	Diameter	1.59	m	Oxygen	20.0	%
Ambient Temperature	31.8	°C	Shape	Circle		Carbon Dioxide	0.3	%
Type of Process	Process		Stack Temperature	46.8	°C	Gas Velocity	12.0	m/s
Type of Fuel	-		Moisture	13.84	%	Flow Rate (Actual O2)	68096	Nm3/hr
Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location	
Air Testing								
Acrylic Acid	11:05 AM - 11:25 PM	ppm	-	1.0	<1.0	Based on OSHA, ID 28	Bangkok	
Propylene glycol	11:05 AM - 11:20 AM	ppm	-	1.00	<1.00	United States Environmental Protection Agency, EPA Method 18	Bangkok	
Total VOCs as Propane	11:05 AM - 11:15 AM	ppm	-	1.0	165	United States Environmental Protection Agency, EPA Method 25A	Bangkok	

Sampling By : Kantaphon Maneesampan, Saksit Phaisanphisit

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

Approved by

Saranya C.
Saranya Chalermhamrong
Scientist (4)

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S:\Report\Air_Stack_NGL_rpt (9-344M)



Analysis / Test Report

Client : BASF (Thai) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Pluakdaeng, Amphur
Pluakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136519
Date Received : Dec 10, 2024
Date Reported : Dec 16, 2024
Report Number: 3181489-1

Page 1 of 1

Sample Number	24136519-1							
Sampled Date	Dec 10, 2024							
Sample Description	Emission from Stationary Source							
Location	Process Baghouse Stack (GPS 47P 0733140, 1438817)							
Date Analysis Commenced	Dec 11, 2024							
Condition of Sample	Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one 10-L air sampling bag							
Stack Description								
Ambient Pressure	751	mmHg	Diameter	0.50 x 0.45	m	Oxygen	20.9	%
Ambient Temperature	30.8	°C	Shape	Rectangular		Carbon Dioxide	0.2	%
Type of Process	Process		Stack Temperature	98.5	°C	Gas Velocity	23.2	m/s
Type of Fuel	-		Moisture	3.03	%	Flow Rate (Actual O2)	14500	Nm3/hr
Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Testing Location
Air Testing								
Total Suspended Particulate	10:20 AM - 11:12 AM	mg/m3	-	0.5	<0.5	400	United States Environmental Protection Agency, EPA Method 5	Rayong
Guideline : Notification of the Ministry of Industry 2006 (B.E. 2549) Published in the Royal Government Gazette, Vol.123 Special Part 125 D, dated December 4, 2006 (B.E. 2549)								
Sampling By : Kantaphon Maneesampan วนธนเบญจกุล 7-323-น-0043								
Remark : - LOD : Limit of Detection - "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting) - Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025. - The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.								

Technical Management

Thanita K.
Thanita Kulsriwong
Scientist (4)
ทะเบียนเลขที่ 7-323-น-0029

Approved by

D. Chongchon
Dej Chongchon
Senior Manager
ทะเบียนเลขที่ 7-323-น-0001

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S:\Report\Air_Stack_GL_rpt (4-18PM)



Analysis / Test Report

TESTING
No.0042

Client : BASF (Thai) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur
Plauckdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136520
Date Received : Dec 10, 2024
Date Reported : Dec 16, 2024
Report Number: 3181492-1

Page 1 of 1

Sample Number 24136520-1
Sampled Date Dec 10, 2024
Sample Description Emission from Stationary Source
Location Packaging Baghouse Stack (GPS 47P 0733163, 1438822) (BH-1080)
Date Analysis Commenced Dec 11, 2024
Condition of Sample Extracted into one filter paper placed in plastic petri dish, one plastic bottle and one 10-L air sampling bag

Stack Description									
Ambient Pressure	751	mmHg	Diameter	0.45 x 0.35	m	Oxygen	20.9	%	
Ambient Temperature	30.8	°C	Shape	Rectangular		Carbon Dioxide	0.1	%	
Type of Process	Process		Stack Temperature	48.0	°C	Gas Velocity	7.4	m/s	
Type of Fuel	-		Moisture	3.00	%	Flow Rate (Actual O2)	3725	Nm3/hr	

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Testing Location
Air Testing								
Total Suspended Particulate	11:30 AM - 12:22 PM	mg/m3	-	0.5	<0.5	400	United States Environmental Protection Agency, EPA Method 5	Rayong

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

Sampling By : Kantaphon Maneesampan รหัสประจำตัว 3-323-4-0043

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Thanitak.

Approved by

D. Khun

Thanita Kulsuriwong
Scientist (4)
รหัสประจำตัว 3-323-4-0029

Dej Changchon
Senior Manager
รหัสประจำตัว 3-323-4-0001

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Analysis / Test Report

Client : BASF (Thai) Limited
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Plauckdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136522
Date Received : Dec 16, 2024
Date Reported : Dec 20, 2024
Report Number: 3181499-1

Page 1 of 1

Sample Description Air Quality
Location ภายในโรงงานอุตสาหกรรม (GPS 47P 0733097, 1439770)
Parameter Nitrogen dioxide (ppm)
Measurement Date Dec 06, 2024 - Dec 13, 2024
Measurement by Chatchai Sukpia

Time	24136522-1 Dec 06, 2024	24136522-2 Dec 07, 2024	24136522-3 Dec 08, 2024	24136522-4 Dec 09, 2024	24136522-5 Dec 10, 2024	24136522-6 Dec 11, 2024	24136522-7 Dec 12, 2024
10:00 AM - 11:00 AM	0.0017	0.0021	0.0013	0.0008	0.0009	0.0014	0.0012
11:00 AM - 12:00 PM	0.0018	0.0020	0.0015	0.0005	0.0005	0.0011	0.0009
12:00 PM - 01:00 PM	0.0017	0.0018	0.0013	0.0007	0.0005	0.0008	0.0006
01:00 PM - 02:00 PM	0.0015	0.0009	0.0014	0.0005	0.0004	0.0007	0.0009
02:00 PM - 03:00 PM	0.0016	0.0013	0.0014	0.0008	0.0009	0.0005	0.0005
03:00 PM - 04:00 PM	0.0011	0.0013	0.0010	0.0005	0.0005	0.0007	0.0009
04:00 PM - 05:00 PM	0.0008	0.0009	0.0013	0.0005	0.0005	0.0006	0.0009
05:00 PM - 06:00 PM	0.0012	0.0010	0.0014	0.0003	0.0006	0.0006	0.0012
06:00 PM - 07:00 PM	0.0011	0.0006	0.0010	0.0004	0.0005	0.0005	0.0020
07:00 PM - 08:00 PM	0.0012	0.0009	0.0009	0.0008	0.0008	0.0004	0.0011
08:00 PM - 09:00 PM	0.0021	0.0013	0.0013	0.0008	0.0009	0.0006	0.0009
09:00 PM - 10:00 PM	0.0028	0.0013	0.0018	0.0007	0.0007	0.0011	0.0008
10:00 PM - 11:00 PM	0.0030	0.0019	0.0008	0.0007	0.0019	0.0012	0.0008
11:00 PM - 12:00 AM	0.0023	0.0036	0.0011	0.0008	0.0021	0.0016	0.0008
12:00 AM - 01:00 AM	0.0022	0.0025	0.0007	0.0013	0.0026	0.0013	0.0011
01:00 AM - 02:00 AM	0.0036	0.0038	0.0012	0.0004	0.0019	0.0010	0.0008
02:00 AM - 03:00 AM	0.0023	0.0030	0.0004	0.0006	0.0015	0.0009	0.0008
03:00 AM - 04:00 AM	0.0020	0.0020	0.0006	0.0008	0.0013	0.0012	0.0009
04:00 AM - 05:00 AM	0.0023	0.0021	0.0005	0.0009	0.0012	0.0010	0.0009
05:00 AM - 06:00 AM	0.0018	0.0016	0.0006	0.0006	0.0014	0.0008	0.0007
06:00 AM - 07:00 AM	0.0018	0.0014	0.0005	0.0010	0.0013	0.0009	0.0009
07:00 AM - 08:00 AM	0.0035	0.0012	0.0004	0.0009	0.0016	0.0009	0.0009
08:00 AM - 09:00 AM	0.0016	0.0010	0.0003	0.0006	0.0015	0.0011	0.0007
09:00 AM - 10:00 AM	0.0028	0.0014	0.0010	0.0009	0.0020	0.0015	0.0012
Average	0.0020	0.0017	0.0010	0.0007	0.0012	0.0009	0.0009
1hr - Maximum	0.0036	0.0038	0.0018	0.0013	0.0026	0.0016	0.0020
Standard 1hr - Average	0.170	0.170	0.170	0.170	0.170	0.170	0.170

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).
Reference Method : US EPA Method Part 50 App. F (Chemiluminescence)

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : BASF (Thai) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur
Plauckdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136522
Date Received : Dec 16, 2024
Date Reported : Dec 20, 2024
Report Number: 3197826-1

Page 1 of 1

Sample Description Air Quality
Location ภายในโรงงาน (GPS 47P 0728363, 1441336)
Parameter Nitrogen dioxide (ppm)
Measurement Date Dec 06, 2024 - Dec 13, 2024
Measurement by Chatchai Sukpia

Time	24136522-8 Dec 06, 2024	24136522-9 Dec 07, 2024	24136522-10 Dec 08, 2024	24136522-11 Dec 09, 2024	24136522-12 Dec 10, 2024	24136522-13 Dec 11, 2024	24136522-14 Dec 12, 2024
11:00 AM - 12:00 PM	0.0031	0.0039	0.0038	0.0030	0.0024	0.0028	0.0027
12:00 PM - 01:00 PM	0.0031	0.0031	0.0035	0.0031	0.0021	0.0027	0.0026
01:00 PM - 02:00 PM	0.0027	0.0033	0.0034	0.0029	0.0020	0.0026	0.0028
02:00 PM - 03:00 PM	0.0031	0.0028	0.0033	0.0029	0.0018	0.0024	0.0026
03:00 PM - 04:00 PM	0.0032	0.0025	0.0030	0.0027	0.0017	0.0023	0.0028
04:00 PM - 05:00 PM	0.0029	0.0029	0.0028	0.0027	0.0022	0.0022	0.0026
05:00 PM - 06:00 PM	0.0034	0.0025	0.0029	0.0028	0.0020	0.0022	0.0026
06:00 PM - 07:00 PM	0.0033	0.0036	0.0032	0.0030	0.0022	0.0023	0.0027
07:00 PM - 08:00 PM	0.0038	0.0030	0.0027	0.0027	0.0027	0.0024	0.0024
08:00 PM - 09:00 PM	0.0028	0.0048	0.0029	0.0028	0.0034	0.0024	0.0028
09:00 PM - 10:00 PM	0.0037	0.0048	0.0028	0.0028	0.0040	0.0022	0.0028
10:00 PM - 11:00 PM	0.0020	0.0040	0.0026	0.0026	0.0044	0.0023	0.0030
11:00 PM - 12:00 AM	0.0025	0.0023	0.0025	0.0026	0.0030	0.0021	0.0037
12:00 AM - 01:00 AM	0.0032	0.0041	0.0023	0.0026	0.0028	0.0023	0.0037
01:00 AM - 02:00 AM	0.0030	0.0048	0.0026	0.0027	0.0029	0.0024	0.0026
02:00 AM - 03:00 AM	0.0030	0.0041	0.0025	0.0026	0.0027	0.0022	0.0029
03:00 AM - 04:00 AM	0.0028	0.0049	0.0023	0.0026	0.0026	0.0023	0.0022
04:00 AM - 05:00 AM	0.0039	0.0034	0.0025	0.0038	0.0049	0.0027	0.0026
05:00 AM - 06:00 AM	0.0041	0.0031	0.0025	0.0030	0.0043	0.0048	0.0030
06:00 AM - 07:00 AM	0.0021	0.0039	0.0030	0.0033	0.0030	0.0041	0.0021
07:00 AM - 08:00 AM	0.0038	0.0043	0.0036	0.0039	0.0043	0.0045	0.0037
08:00 AM - 09:00 AM	0.0032	0.0046	0.0034	0.0034	0.0040	0.0039	0.0040
09:00 AM - 10:00 AM	0.0039	0.0044	0.0035	0.0033	0.0036	0.0031	0.0034
10:00 AM - 11:00 AM	0.0024	0.0037	0.0031	0.0029	0.0030	0.0027	0.0028
Average	0.0031	0.0037	0.0029	0.0029	0.0030	0.0027	0.0029
1hr - Maximum	0.0041	0.0049	0.0038	0.0039	0.0049	0.0048	0.0040
Standard 1hr - Average	0.170	0.170	0.170	0.170	0.170	0.170	0.170

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).
Reference Method : US EPA Method Part 50 App. F (Chemiluminescence)

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : BASF (Thai) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur
Plauckdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136524
Date Received : Dec 16, 2024
Date Reported : Dec 19, 2024
Report Number: 3181505-1

Page 1 of 1

Sample Description Air Quality
Location ภายในโรงงานอุตสาหกรรม (GPS 47P 0733097, 1439770)
Date Analysis Commenced Dec 16, 2024
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)
24136524-1	Dec 06 - Dec 07, 2024	0.093	756	31
24136524-2	Dec 07 - Dec 08, 2024	0.097	756	30
24136524-3	Dec 08 - Dec 09, 2024	0.071	756	30
24136524-4	Dec 09 - Dec 10, 2024	0.072	756	30
24136524-5	Dec 10 - Dec 11, 2024	0.114	756	30
24136524-6	Dec 11 - Dec 12, 2024	0.086	756	30
24136524-7	Dec 12 - Dec 13, 2024	0.058	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 : Chatchai Sukpia
Remark :
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by

Thanitak.

Thanita Kulsuriwong
Scientist (4)

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plaakdaeng, Amphur Plaakdaeng, Rayong
Thailand 21140

P/O :
Project Name : Factory I Monthly
Project Location : ESIE

Lot ID: 2472252

Date Received : Jul 10, 2024
Date Reported : Jul 16, 2024
Report Number : 3036176-3

Page 1 of 1

Sample Number 2472252-1
Sampled Date Jul 10, 2024 10:14 AM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.

Date Analysis Commenced Jul 11, 2024
Condition of Sample Contained in one amber glass bottle and four plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)
Physical Property Yellow, some odour, a lot of solid and some turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Phosphate as P	mg/L	0.002	0.005	2.982	No Standard	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-P (E)	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Tanasit Wongsachai , Kardsundit Kitsupavanit

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

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

Approved by

Chontichak
Chonticha Subongkroh
Scientist (3)

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plaakdaeng, Amphur Plaakdaeng, Rayong
Thailand 21140

P/O :
Project Name : Factory I Monthly
Project Location : ESIE



TESTING
No.0042

Lot ID: 2484311

Date Received : Aug 01, 2024
Date Reported : Aug 08, 2024
Report Number : 3064435-1

Page 1 of 2

Sample Number 2484311-1
Sampled Date Aug 01, 2024 3:05 PM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.

Date Analysis Commenced Aug 01, 2024
Condition of Sample Contained in one amber glass bottle and four plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)
Physical Property Yellow, some odour, solid and no turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	40.2	≤500	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	188	≤750	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	4	≤10	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH (on site) *		-	-	7.6	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	30.7	≤45	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	30.7	≤100	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	22	≤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.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Suphanat Sakulk หนึ่งแสนสี่ 3-323-0-0021 , Pattarapol Sawangjaitam หนึ่งแสนสี่ 3-204-0-0002

Remark :
- LOD : Limit of Detection

Technical Management

Photchana S.
Photchana Seeda
Scientist (4)
หนึ่งแสนสี่ 3-323-0-9446

Approved by

D. Chanchon
Dej Chanchon
Senior Manager
หนึ่งแสนสี่ 3-323-0-9442

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plaakdaeng, Amphur Plaakdaeng, Rayong
Thailand 21140

P/O :
Project Name : Factory I Monthly
Project Location : ESIE

TESTING
No.0042

Lot ID: 2484311

Date Received : Aug 01, 2024
Date Reported : Aug 08, 2024
Report Number : 3064435-1

Page 2 of 2

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

Technical Management

Photchana S.
Photchana Seeda
Scientist (4)
หนึ่งแสนสี่ 3-323-0-9446

Approved by

D. Chanchon
Dej Chanchon
Senior Manager
หนึ่งแสนสี่ 3-323-0-9442

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plaakdaeng, Amphur Plaakdaeng, Rayong
Thailand 21140

P/O :
Project Name : Factory I Monthly
Project Location : ESIE



TESTING
No.0009

Lot ID: 2484311

Date Received : Aug 01, 2024
Date Reported : Aug 08, 2024
Report Number : 3064435-2

Page 1 of 1

Sample Number 2484311-1
Sampled Date Aug 01, 2024 3:05 PM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.

Date Analysis Commenced Aug 03, 2024
Condition of Sample Contained in one amber glass bottle and four plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)
Physical Property Yellow, some odour, solid and no turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Zinc	mg/L	0.003	0.005	0.72	≤5.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Suphanat Sakulk หนึ่งแสนสี่ 3-323-0-0021 , Pattarapol Sawangjaitam หนึ่งแสนสี่ 3-204-0-0002

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

Technical Management

Sawitree N.
Sawitree Naisangiam
Manager
หนึ่งแสนสี่ 3-204-0-0007

Approved by

Kanokorn Anek
Kanokorn Anek
Assistant General Manager
หนึ่งแสนสี่ 3-204-0-0004

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Analysis / Test Report

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112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140

P/O :
Project Name : Factory I Monthly
Project Location : ESIE

Lot ID: 2484311
Date Received : Aug 01, 2024
Date Reported : Aug 08, 2024
Report Number : 3064435-3

Page 1 of 1

Sample Number 2484311-1
Sampled Date Aug 01, 2024 3:05 PM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.
Date Analysis Commenced Aug 02, 2024
Condition of Sample Contained in one amber glass bottle and four plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)
Physical Property Yellow, some odour, solid and no turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Phosphate as P	mg/L	0.002	0.005	3.733	No Standard	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-P (E)	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Suphanat Sakul , Pattarapol Sawangjaitam

Remark :
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Approved by

Photchanna S.
Photchana Seeda
Scientist (4)

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Analysis / Test Report

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112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140

P/O :
Project Name : Factory I Monthly
Project Location : ESIE



TESTING
No.0042

Lot ID: 2497201
Date Received : Sep 13, 2024
Date Reported : Sep 18, 2024
Report Number : 3091150-1

Page 1 of 2

Sample Number 2497201-1
Sampled Date Sep 13, 2024 10:16 AM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.
Date Analysis Commenced Sep 13, 2024
Condition of Sample Contained in one amber glass bottle and four plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)
Physical Property Yellow, some odour, solid and no turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	9.8	≤500	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	53	≤750	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	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 (on site) *	-	-	-	7.1	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	31.7	≤45	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	17.8	≤100	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	12	≤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.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Paramet Sattayakun ๓-323-๓-0051 , Kardbundi Kitisupavanit ๓-204-๓-0001

Remark :
- LOD : Limit of Detection

Technical Management

Photchanna S.
Photchana Seeda
Scientist (4)
๓-323-๓-0028

Approved by

D. Chanchon
Dej Chanchon
Senior Manager
๓-204-๓-0001

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Analysis / Test Report

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112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140

P/O :
Project Name : Factory I Monthly
Project Location : ESIE

TESTING
No.0042
Lot ID: 2497201
Date Received : Sep 13, 2024
Date Reported : Sep 18, 2024
Report Number : 3091150-1

Page 2 of 2

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Technical Management

Photchanna S.
Photchana Seeda
Scientist (4)
๓-323-๓-0028

Approved by

D. Chanchon
Dej Chanchon
Senior Manager
๓-204-๓-0001

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140

P/O :
Project Name : Factory I Monthly
Project Location : ESIE



TESTING
No.0000

Lot ID: 2497201
Date Received : Sep 13, 2024
Date Reported : Sep 18, 2024
Report Number : 3091150-2

Page 1 of 1

Sample Number 2497201-1
Sampled Date Sep 13, 2024 10:16 AM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.
Date Analysis Commenced Sep 16, 2024
Condition of Sample Contained in one amber glass bottle and four plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)
Physical Property Yellow, some odour, solid and no turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Zinc	mg/L	0.003	0.005	0.58	≤5.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Paramet Sattayakun ๓-323-๓-0051 , Kardbundi Kitisupavanit ๓-204-๓-0001

Remark :
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Technical Management

Chanatt L.
Chanattarn Imchom
Section Head
๓-204-๓-0008

Approved by

Kanokorn Anek
Kanokkorn Anek
Assistant General Manager
๓-204-๓-0004

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140

P/O :
Project Name : Factory I Monthly
Project Location : ESIE

Lot ID: 2497201
Date Received : Sep 13, 2024
Date Reported : Sep 18, 2024
Report Number : 3091150-3

Page 1 of 1

Sample Number 2497201-1
Sampled Date Sep 13, 2024 10:16 AM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.
Date Analysis Commenced Sep 16, 2024
Condition of Sample Contained in one amber glass bottle and four plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)
Physical Property Yellow, some odour, solid and no turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Phosphate as P	mg/L	0.002	0.005	2.356	No Standard	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-P (E)	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Paramet Sattayakun , Kardsundit Kitsupavant

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

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Photchana Seeda
Scientist (4)

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140

P/O :
Project Name : Random Check
Project Location : ESIE

TESTING
No.0042
Lot ID: 24110515
Date Received : Oct 07, 2024
Date Reported : Oct 15, 2024
Report Number : 3122013-1

Page 1 of 2

Sample Number 24110515-1
Sampled Date Oct 07, 2024 9:25 AM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.
Date Analysis Commenced Oct 07, 2024
Condition of Sample Contained in two glass vials, one amber glass bottle and seven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)
Physical Property Yellow, some odour, a lot of solid and some turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	130	≤500	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	381	≤750	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	52	≤600	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	48	≤600	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Cyanide as HCN	mg/L	0.001	0.005	<0.005	≤0.2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-CN (C, E)	Rayong
Formaldehyde	mg/L	0.03	0.1	<0.1	≤1	Wastewater analysis manual, Environmental Engineering Association of Thailand, 4th ed., 2004	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 B	Rayong
pH (on site) *	-	-	-	6.5	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong

Technical Management

Photchanna S.
Photchana Seeda
Scientist (4)
หมายเลขโทรศัพท์ 3-323-4-0028

Approved by

D. Chanchon
Dej Chanchon
Senior Manager
หมายเลขโทรศัพท์ 3-323-4-0001

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140

P/O :
Project Name : Random Check
Project Location : ESIE

TESTING
No.0042
Lot ID: 24110515
Date Received : Oct 07, 2024
Date Reported : Oct 15, 2024
Report Number : 3122013-1

Page 2 of 2

Sample Number 24110515-1
Sampled Date Oct 07, 2024 9:25 AM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.
Date Analysis Commenced Oct 07, 2024
Condition of Sample Contained in two glass vials, one amber glass bottle and seven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)
Physical Property Yellow, some odour, a lot of solid and some turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Phenol	mg/L	0.005	0.01	0.04	≤1	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5530 D	Rayong
Temperature *	Degree C	-	-	34.6	≤45	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	552	≤3000	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	10.2	≤100	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	41	≤200	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Warunyoo Chimpheke หมายเลขโทรศัพท์ 3-323-4-0020 , Samart Khumpluee หมายเลขโทรศัพท์ 3-204-4-0084

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Photchanna S.
Photchana Seeda
Scientist (4)
หมายเลขโทรศัพท์ 3-323-4-0028

Approved by

D. Chanchon
Dej Chanchon
Senior Manager
หมายเลขโทรศัพท์ 3-323-4-0001

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140

P/O :
Project Name : Random Check
Project Location : ESIE

TESTING
No.0009
Lot ID: 24110515
Date Received : Oct 07, 2024
Date Reported : Oct 15, 2024
Report Number : 3122013-2

Page 1 of 2

Sample Number 24110515-1
Sampled Date Oct 07, 2024 9:25 AM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.
Date Analysis Commenced Oct 08, 2024
Condition of Sample Contained in two glass vials, one amber glass bottle and seven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)
Physical Property Yellow, some odour, a lot of solid and some turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Arsenic	mg/L	0.0003	0.0005	0.002	≤0.25	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B, 3030 F	Bangkok
Barium	mg/L	0.0003	0.0005	0.08	≤1.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B, 3030 F	Bangkok
Cadmium	mg/L	0.0003	0.0005	Not Detected	≤0.03	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B, 3030 F	Bangkok
Copper	mg/L	0.0003	0.0005	0.04	≤2.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B, 3030 F	Bangkok
Hexavalent Chromium	mg/L	0.003	0.01	Not Detected	≤0.25	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3500-Cr B	Bangkok
Lead	mg/L	0.0003	0.0005	0.003	≤0.2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B, 3030 F	Bangkok
Manganese	mg/L	0.0003	0.0005	0.04	≤5.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B, 3030 F	Bangkok

Technical Management

Chanatt L.
Chanattarn Inthom
Section Head
หมายเลขโทรศัพท์ 3-204-4-0008

Approved by

Kanokorn Anek
Kanokorn Anek
Assistant General Manager
หมายเลขโทรศัพท์ 3-204-4-0004

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140

P/O :
Project Name : Random Check
Project Location : ESIE



TESTING
No.0009
Lot ID: 24110515
Date Received : Oct 07, 2024
Date Reported : Oct 15, 2024
Report Number : 3122013-2

Page 2 of 2

Sample Number 24110515-1
Sampled Date Oct 07, 2024 9:25 AM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.
Date Analysis Commenced Oct 08, 2024
Condition of Sample Contained in two glass vials, one amber glass bottle and seven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)
Physical Property Yellow, some odour, a lot of solid and some turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Mercury *	mg/L	0.0001	0.0005	Not Detected	≤0.005	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3112	Bangkok
Nickel	mg/L	0.0003	0.0005	0.004	≤1.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Selenium	mg/L	0.0003	0.0005	Not Detected	≤0.02	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Trivalent Chromium *	mg/L	-	0.01	<0.01	≤0.75	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Zinc	mg/L	0.003	0.005	0.39	≤5.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.
Sampling By : Warunyoo Chimphalee รหัสประจำตัว >323-4-0020 , Samart Khumplhee รหัสประจำตัว >204-4-0084

Remark :
· LOD : Limit of Detection
· "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
· Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
· The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chanatt L.

Chanattagn Imchom
Section Head
รหัสประจำตัว >204-4-0008

Approved by

Kanokorn Anuk

Kanokorn Anuk
Assistant General Manager
รหัสประจำตัว >204-4-0004

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140

P/O :
Project Name : Random Check
Project Location : ESIE



TESTING
No.0009
Lot ID: 24110515
Date Received : Oct 07, 2024
Date Reported : Oct 15, 2024
Report Number : 3122013-3

Page 1 of 2

Sample Number 24110515-1
Sampled Date Oct 07, 2024 9:25 AM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.
Date Analysis Commenced Oct 08, 2024
Condition of Sample Contained in two glass vials, one amber glass bottle and seven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)
Physical Property Yellow, some odour, a lot of solid and some turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Iron	mg/L	0.003	0.005	0.57	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Water Testing							
Ammonia Nitrogen *	mg/L	0.05	0.1	3.8	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-NH3 (D)	Rayong
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	792	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Fluoride as F *	mg/L	0.06	0.2	0.4	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-F (D)	Rayong
Nitrate as N *	mg/L	0.015	0.05	0.45	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-NO3 (E)	Rayong
Phosphate as P *	mg/L	0.002	0.005	1.315	No Standard	In-house method based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-P (E)	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Warunyoo Chimphalee , Samart Khumplhee

Remark :
· LOD : Limit of Detection
· "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140

P/O :
Project Name : Random Check
Project Location : ESIE



TESTING
No.0009
Lot ID: 24110515
Date Received : Oct 07, 2024
Date Reported : Oct 15, 2024
Report Number : 3122013-3

Page 2 of 2

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Approved by

Chanatt L.

Chanattagn Imchom
Section Head

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140

P/O :
Project Name : Factory 1 Monthly
Project Location : ESIE



TESTING
No.0042
Lot ID: 24122986
Date Received : Nov 12, 2024
Date Reported : Nov 18, 2024
Report Number : 3151530-1

Page 1 of 2

Sample Number 24122986-1
Sampled Date Nov 12, 2024 2:55 PM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.
Date Analysis Commenced Nov 12, 2024
Condition of Sample Contained in one amber glass bottle and four plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)
Physical Property Yellow, a lot of odour, solid and some turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	33.7	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	126	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH (on site) *	-	-	-	8.0	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	32.2	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	35.0	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C), part 4500 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	27	<200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Warunyoo Chimphalee รหัสประจำตัว >323-4-0020 , Samart Khumplhee รหัสประจำตัว >204-4-0084

Remark :
· LOD : Limit of Detection

Technical Management

Photchana S.

Photchana Seeds
Scientist (4)
รหัสประจำตัว >323-4-0028

Approved by

D. Khunon

Dij Chanchong
Senior Manager
รหัสประจำตัว >323-4-0001

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140
P/O :
Project Name : Factory I Monthly
Project Location : ESIE



TESTING
No.0042
Lot ID: 24122986
Date Received : Nov 12, 2024
Date Reported : Nov 18, 2024
Report Number : 3151530-1

Page 2 of 2

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Technical Management

Photchana S.

Photchana Seeda
Scientist (4)
☎️-323-4-0028

Approved by

D. Chanchon

Dej Chanchon
Senior Manager
☎️-323-4-0001

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
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Thailand 21140
P/O :
Project Name : Factory I Monthly
Project Location : ESIE



TESTING
No.0009
Lot ID: 24122986
Date Received : Nov 12, 2024
Date Reported : Nov 18, 2024
Report Number : 3151530-2

Page 1 of 1

Sample Number 24122986-1
Sampled Date Nov 12, 2024 2:55 PM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.
Date Analysis Commenced Nov 13, 2024
Condition of Sample Contained in one amber glass bottle and four plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)
Physical Property Yellow, a lot of odour, solid and some turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Zinc	mg/L	0.003	0.005	0.65	≤5.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B, 3030 F	Bangkok

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Warunyo Chimphalee ☎️-323-4-0020 , Samart Khumhlee ☎️-204-4-0084

Remark :

- LOD : Limit of Detection
• “<” : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
• Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
• The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Savitree N.

Savitree Noisangam
Manager
☎️-204-4-0007

Approved by

Kanokorn Anek

Kanokorn Anek
Assistant General Manager
☎️-204-4-0004

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140
P/O :
Project Name : Factory I Monthly
Project Location : ESIE

Lot ID: 24122986
Date Received : Nov 12, 2024
Date Reported : Nov 18, 2024
Report Number : 3151530-3

Page 1 of 1

Sample Number 24122986-1
Sampled Date Nov 12, 2024 2:55 PM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.
Date Analysis Commenced Nov 13, 2024
Condition of Sample Contained in one amber glass bottle and four plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)
Physical Property Yellow, a lot of odour, solid and some turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Phosphate as P	mg/L	0.002	0.005	4.592	No Standard	In-house method based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-P (E)	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Warunyo Chimphalee , Samart Khumhlee

Remark :

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

Approved by

Photchana S.

Photchana Seeda
Scientist (4)

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Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140
P/O :
Project Name : Factory I Monthly
Project Location : ESIE



TESTING
No.0042
Lot ID: 24134885
Date Received : Dec 02, 2024
Date Reported : Dec 07, 2024
Report Number : 3178563-1

Page 1 of 2

Sample Number 24134885-1
Sampled Date Dec 02, 2024 2:58 PM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Thai) Limited.
Date Analysis Commenced Dec 02, 2024
Condition of Sample Contained in one amber glass bottle and four plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)
Physical Property Yellow, some odour, solid and turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	25.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	71	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH (on site) *		-	-	7.8	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	30.8	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	31.2	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C), part 4500 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	19	<200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Wasan Kinunti ☎️-323-4-0019 , Kardbundi Kitsapavanit ☎️-204-4-0001

Remark :

- LOD : Limit of Detection

Technical Management

Photchana S.

Photchana Seeda
Scientist (4)
☎️-323-4-0028

Approved by

D. Chanchon

Dej Chanchon
Senior Manager
☎️-323-4-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory.
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S:\Reports\AL_SL_rpt (4.449P)



Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140

P/O :
Project Name : Factory I Monthly
Project Location : ESIE



TESTING
No.0042
Lot ID: 24134885
Date Received : Dec 02, 2024
Date Reported : Dec 07, 2024
Report Number : 3178563-1

Page 2 of 2

- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

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Approved by

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Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory.
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S:\Reports\AL_SL_rpt (4-4498)



Analysis / Test Report

Client : Eastern Seaboard Industrial Estate (Rayong) Co., Ltd.
112 Moo 4, Highway 331 Road, Tambol Plauckdaeng, Amphur Plauckdaeng, Rayong
Thailand 21140

P/O :
Project Name : Factory I Monthly
Project Location : ESIE



TESTING
No.0009
Lot ID: 24134885
Date Received : Dec 02, 2024
Date Reported : Dec 10, 2024
Report Number : 3178563-2

Page 1 of 1

Sample Number 24134885-1
Sampled Date Dec 02, 2024 2:58 PM
Sample Description Wastewater
Contract ID L_ESIE_022_2550 **Plot** S-40 **Site** BASF (Tha) Limited.
Date Analysis Commenced Dec 03, 2024
Condition of Sample Contained in one amber glass bottle and four plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)
Physical Property Yellow, some odour, solid and turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Zinc	mg/L	0.003	0.005	0.27	≤5.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 3125 B, 3030 F	Bangkok
Water Testing							
Phosphate as P *	mg/L	0.002	0.005	4.541	No Standard	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-P (E)	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Wissan Kinrui โทรศัพท์ +323-4-0019, Kardbundi Kitsupavanit โทรศัพท์ +204-4-0001

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Savitree N.

Savitree Noisangam
Manager
โทรศัพท์ +204-4-0007

Approved by

Kanokorn Anek

Kanokorn Anek
Assistant General Manager
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Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory.
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S:\Reports\AL_SL_rpt (3-2898)



Analysis / Test Report

Client : BASF (Tha) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585
Project Name : Monitoring
Project Location :



TESTING
No.0042
Lot ID: 24136527
Date Received : Dec 16, 2024
Date Reported : Dec 19, 2024
Report Number : 3197565-1

Page 1 of 1

Sample Number 24136527-1
Parameter Noise (Leq 24 hrs.)
Location ฝั่งซ้ายของพื้นที่ถมที่ดินโรงงาน (GPS 47P 0733191, 1438992)
Measurement Date Dec 06 - Dec 07, 2024
Measurement by Chatchai Sukpla
Sound Level meter Serial No. 920831

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	57.8	78.0	56.7
11:00 AM - 12:00 PM	59.8	78.2	57.0
12:00 PM - 01:00 PM	56.8	64.5	56.0
01:00 PM - 02:00 PM	57.4	62.5	56.5
02:00 PM - 03:00 PM	58.2	66.3	57.0
03:00 PM - 04:00 PM	57.7	66.3	56.8
04:00 PM - 05:00 PM	58.6	64.7	57.5
05:00 PM - 06:00 PM	57.6	66.6	56.8
06:00 PM - 07:00 PM	58.6	70.5	57.1
07:00 PM - 08:00 PM	57.6	65.5	56.8
08:00 PM - 09:00 PM	58.0	64.9	57.3
09:00 PM - 10:00 PM	58.7	65.9	57.9
10:00 PM - 11:00 PM	58.6	62.9	57.8
11:00 PM - 12:00 AM	59.0	79.5	57.9
12:00 AM - 01:00 AM	59.1	64.8	58.2
01:00 AM - 02:00 AM	58.6	65.2	57.8
02:00 AM - 03:00 AM	58.9	66.6	58.1
03:00 AM - 04:00 AM	58.1	68.0	57.4
04:00 AM - 05:00 AM	58.6	70.5	57.5
05:00 AM - 06:00 AM	60.1	72.9	58.5
06:00 AM - 07:00 AM	58.4	65.3	57.7
07:00 AM - 08:00 AM	59.0	67.6	58.2
08:00 AM - 09:00 AM	58.2	64.7	57.4
09:00 AM - 10:00 AM	58.1	65.2	57.3

Leq Average 24 hrs. (dB(A)) 58.5
Lmax (dB(A)) 79.5
L90 (dB(A)) 57.4
Ldn (dB(A)) 65.2
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และวิธีสังเกตผลจากการรบกวนการประกอบกิจการโรงงาน พ.ศ. 2548

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

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supt S

Supt Salameth
Section Head

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S:\Reports\Air Noise.rpt (3-37PM)



Analysis / Test Report

Client : BASF (Tha) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585
Project Name : Monitoring
Project Location :



TESTING
No.0042
Lot ID: 24136527
Date Received : Dec 16, 2024
Date Reported : Dec 19, 2024
Report Number : 3197566-1

Page 1 of 1

Sample Number 24136527-2
Parameter Noise (Leq 24 hrs.)
Location ฝั่งซ้ายของพื้นที่ถมที่ดินโรงงาน (GPS 47P 0733191, 1438992)
Measurement Date Dec 07 - Dec 08, 2024
Measurement by Chatchai Sukpla
Sound Level meter Serial No. 920831

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	57.6	62.4	56.7
11:00 AM - 12:00 PM	57.6	61.3	56.6
12:00 PM - 01:00 PM	56.6	61.9	55.6
01:00 PM - 02:00 PM	57.3	70.9	56.3
02:00 PM - 03:00 PM	57.6	65.0	56.6
03:00 PM - 04:00 PM	57.1	63.8	56.3
04:00 PM - 05:00 PM	57.8	65.2	56.9
05:00 PM - 06:00 PM	57.8	68.7	56.8
06:00 PM - 07:00 PM	58.5	67.7	57.5
07:00 PM - 08:00 PM	58.2	68.7	57.4
08:00 PM - 09:00 PM	58.1	64.3	57.4
09:00 PM - 10:00 PM	59.3	68.2	58.3
10:00 PM - 11:00 PM	59.7	79.2	58.3
11:00 PM - 12:00 AM	58.5	63.1	57.8
12:00 AM - 01:00 AM	58.9	63.1	58.0
01:00 AM - 02:00 AM	58.9	70.1	57.8
02:00 AM - 03:00 AM	58.4	65.2	57.6
03:00 AM - 04:00 AM	57.8	66.6	57.2
04:00 AM - 05:00 AM	57.7	64.0	57.0
05:00 AM - 06:00 AM	58.3	63.0	57.4
06:00 AM - 07:00 AM	57.6	69.4	56.9
07:00 AM - 08:00 AM	58.0	64.5	57.1
08:00 AM - 09:00 AM	57.7	68.0	56.8
09:00 AM - 10:00 AM	57.1	63.6	56.3

Leq Average 24 hrs. (dB(A)) 58.1
Lmax (dB(A)) 79.2
L90 (dB(A)) 57.0
Ldn (dB(A)) 64.8
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และวิธีสังเกตผลจากการรบกวนการประกอบกิจการโรงงาน พ.ศ. 2548

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

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supt S

Supt Salameth
Section Head

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S:\Reports\Air Noise.rpt (3-38PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197567-1

Page 1 of 1

Sample Number 24136527-3
Parameter Noise (Leq 24 hrs.)
Location ฟังกลางรั้วด้านทิศเหนือภายในโรงงาน (GPS 47P 0733191, 1438992)
Measurement Date Dec 08 - Dec 09, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 920831

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	57.0	67.8	56.1
11:00 AM - 12:00 PM	56.9	63.8	56.0
12:00 PM - 01:00 PM	56.8	63.5	55.9
01:00 PM - 02:00 PM	56.7	65.4	55.8
02:00 PM - 03:00 PM	56.9	63.0	56.1
03:00 PM - 04:00 PM	56.5	61.3	55.6
04:00 PM - 05:00 PM	56.7	64.1	55.9
05:00 PM - 06:00 PM	56.7	61.8	56.1
06:00 PM - 07:00 PM	56.8	61.3	56.1
07:00 PM - 08:00 PM	56.9	65.8	56.1
08:00 PM - 09:00 PM	57.0	66.0	56.3
09:00 PM - 10:00 PM	57.1	60.5	56.4
10:00 PM - 11:00 PM	57.5	64.4	56.8
11:00 PM - 12:00 AM	57.2	64.7	56.5
12:00 AM - 01:00 AM	57.1	65.2	56.3
01:00 AM - 02:00 AM	56.9	65.0	56.0
02:00 AM - 03:00 AM	56.8	64.9	55.9
03:00 AM - 04:00 AM	57.4	72.5	56.2
04:00 AM - 05:00 AM	57.4	70.0	56.3
05:00 AM - 06:00 AM	57.1	64.8	56.3
06:00 AM - 07:00 AM	57.3	64.7	56.5
07:00 AM - 08:00 AM	57.6	66.9	56.8
08:00 AM - 09:00 AM	57.9	65.3	57.0
09:00 AM - 10:00 AM	58.6	67.0	57.5

Leq Average 24 hrs. (dB(A)) 57.1
Lmax (dB(A)) 72.5
L90 (dB(A)) 56.1
Ldn (dB(A)) 63.6
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot Salameth
Section Head

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Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197568-1

Page 1 of 1

Sample Number 24136527-4
Parameter Noise (Leq 24 hrs.)
Location ฟังกลางรั้วด้านทิศเหนือภายในโรงงาน (GPS 47P 0733191, 1438992)
Measurement Date Dec 09 - Dec 10, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 920831

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	58.5	66.5	57.4
11:00 AM - 12:00 PM	58.3	67.9	57.2
12:00 PM - 01:00 PM	57.7	81.2	56.6
01:00 PM - 02:00 PM	58.7	63.8	57.5
02:00 PM - 03:00 PM	58.4	73.6	57.4
03:00 PM - 04:00 PM	57.9	64.7	56.9
04:00 PM - 05:00 PM	59.0	72.7	57.6
05:00 PM - 06:00 PM	57.9	66.9	57.1
06:00 PM - 07:00 PM	58.6	69.3	57.7
07:00 PM - 08:00 PM	58.3	71.5	57.5
08:00 PM - 09:00 PM	58.2	66.4	57.4
09:00 PM - 10:00 PM	58.8	71.0	57.8
10:00 PM - 11:00 PM	59.4	66.2	58.3
11:00 PM - 12:00 AM	58.1	65.0	57.4
12:00 AM - 01:00 AM	58.8	63.9	57.9
01:00 AM - 02:00 AM	58.5	67.2	57.6
02:00 AM - 03:00 AM	58.9	63.8	58.0
03:00 AM - 04:00 AM	57.8	64.0	57.1
04:00 AM - 05:00 AM	57.9	69.5	57.1
05:00 AM - 06:00 AM	58.4	63.6	57.5
06:00 AM - 07:00 AM	58.2	69.2	57.3
07:00 AM - 08:00 AM	59.0	66.2	58.1
08:00 AM - 09:00 AM	58.2	64.0	57.3
09:00 AM - 10:00 AM	57.7	64.2	57.7

Leq Average 24 hrs. (dB(A)) 58.4
Lmax (dB(A)) 81.2
L90 (dB(A)) 57.4
Ldn (dB(A)) 64.9
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot Salameth
Section Head

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S:\Reports\Air Noise ppt (3.38PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197569-1

Page 1 of 1

Sample Number 24136527-5
Parameter Noise (Leq 24 hrs.)
Location ฟังกลางรั้วด้านทิศเหนือภายในโรงงาน (GPS 47P 0733191, 1438992)
Measurement Date Dec 10 - Dec 11, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 920831

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	58.6	71.1	57.4
11:00 AM - 12:00 PM	58.4	63.3	57.4
12:00 PM - 01:00 PM	57.4	70.0	56.5
01:00 PM - 02:00 PM	58.0	63.4	56.8
02:00 PM - 03:00 PM	58.9	64.4	57.6
03:00 PM - 04:00 PM	57.7	64.1	56.8
04:00 PM - 05:00 PM	59.1	70.9	57.9
05:00 PM - 06:00 PM	58.1	69.8	57.2
06:00 PM - 07:00 PM	59.1	68.4	58.0
07:00 PM - 08:00 PM	58.4	63.1	57.6
08:00 PM - 09:00 PM	58.6	68.6	57.8
09:00 PM - 10:00 PM	59.6	66.4	58.6
10:00 PM - 11:00 PM	59.8	65.0	58.7
11:00 PM - 12:00 AM	58.8	63.5	58.0
12:00 AM - 01:00 AM	59.7	65.3	58.6
01:00 AM - 02:00 AM	59.3	65.4	58.3
02:00 AM - 03:00 AM	59.1	67.4	58.1
03:00 AM - 04:00 AM	58.1	63.6	57.5
04:00 AM - 05:00 AM	58.5	64.5	57.7
05:00 AM - 06:00 AM	59.6	65.1	58.6
06:00 AM - 07:00 AM	58.5	75.9	57.7
07:00 AM - 08:00 AM	59.2	67.4	58.3
08:00 AM - 09:00 AM	58.2	67.1	57.3
09:00 AM - 10:00 AM	57.9	70.1	56.8

Leq Average 24 hrs. (dB(A)) 58.7
Lmax (dB(A)) 75.9
L90 (dB(A)) 57.7
Ldn (dB(A)) 65.4
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot Salameth
Section Head

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122-153/ ENAIL

S:\Reports\Air Noise ppt (3.38PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197570-1

Page 1 of 1

Sample Number 24136527-6
Parameter Noise (Leq 24 hrs.)
Location ฟังกลางรั้วด้านทิศเหนือภายในโรงงาน (GPS 47P 0733191, 1438992)
Measurement Date Dec 11 - Dec 12, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 920831

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	57.2	73.1	56.1
11:00 AM - 12:00 PM	58.1	68.9	56.4
12:00 PM - 01:00 PM	56.6	75.9	55.0
01:00 PM - 02:00 PM	56.8	65.2	55.3
02:00 PM - 03:00 PM	57.6	64.6	56.0
03:00 PM - 04:00 PM	56.5	66.0	55.3
04:00 PM - 05:00 PM	57.6	64.8	56.1
05:00 PM - 06:00 PM	56.3	63.8	55.0
06:00 PM - 07:00 PM	57.1	70.1	55.7
07:00 PM - 08:00 PM	58.1	62.0	55.2
08:00 PM - 09:00 PM	56.9	63.1	56.2
09:00 PM - 10:00 PM	59.0	63.3	58.0
10:00 PM - 11:00 PM	59.6	67.6	58.5
11:00 PM - 12:00 AM	58.1	62.0	57.5
12:00 AM - 01:00 AM	59.0	63.7	58.0
01:00 AM - 02:00 AM	58.7	63.1	57.8
02:00 AM - 03:00 AM	58.7	63.4	57.7
03:00 AM - 04:00 AM	57.8	62.9	57.1
04:00 AM - 05:00 AM	58.2	69.6	57.1
05:00 AM - 06:00 AM	58.9	70.1	57.7
06:00 AM - 07:00 AM	57.8	72.2	57.0
07:00 AM - 08:00 AM	58.9	65.6	57.9
08:00 AM - 09:00 AM	58.7	65.7	57.7
09:00 AM - 10:00 AM	58.7	65.3	57.6

Leq Average 24 hrs. (dB(A)) 58.0
Lmax (dB(A)) 75.9
L90 (dB(A)) 57.0
Ldn (dB(A)) 64.8
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot Salameth
Section Head

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S:\Reports\Air Noise ppt (3.38PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197571-1

Page 1 of 1

Sample Number 24136527-7
Parameter Noise (Leq 24 hrs.)
Location ฝั่งกลางริ้วสวนพืชโตภายในโรงงาน (GPS 47P 0733191, 1438992)
Measurement Date Dec 12 - Dec 13, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 920831

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	58.4	65.0	57.3
11:00 AM - 12:00 PM	58.3	67.6	57.3
12:00 PM - 01:00 PM	57.5	62.5	56.6
01:00 PM - 02:00 PM	57.6	62.6	56.6
02:00 PM - 03:00 PM	58.0	62.3	56.9
03:00 PM - 04:00 PM	57.6	66.1	56.6
04:00 PM - 05:00 PM	58.2	64.8	57.2
05:00 PM - 06:00 PM	58.1	65.6	57.3
06:00 PM - 07:00 PM	58.4	71.3	57.3
07:00 PM - 08:00 PM	58.4	63.7	57.5
08:00 PM - 09:00 PM	58.0	63.5	57.2
09:00 PM - 10:00 PM	58.2	62.8	57.5
10:00 PM - 11:00 PM	58.2	64.4	57.5
11:00 PM - 12:00 AM	57.8	61.6	57.2
12:00 AM - 01:00 AM	58.4	69.2	57.5
01:00 AM - 02:00 AM	58.4	65.2	57.5
02:00 AM - 03:00 AM	58.7	61.9	57.8
03:00 AM - 04:00 AM	57.6	65.9	56.8
04:00 AM - 05:00 AM	58.0	69.6	57.0
05:00 AM - 06:00 AM	59.0	72.0	57.7
06:00 AM - 07:00 AM	57.9	70.5	56.9
07:00 AM - 08:00 AM	59.0	65.5	58.0
08:00 AM - 09:00 AM	58.4	65.1	57.4
09:00 AM - 10:00 AM	58.6	76.6	57.6

Leq Average 24 hrs. (dB(A)) 58.2
Lmax (dB(A)) 76.6
L90 (dB(A)) 57.3
Ldn (dB(A)) 64.7
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supt S
Supt Salameth
Section Head

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S:\Reports\Air Noise rpt (3.39PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197572-1

Page 1 of 1

Sample Number 24136527-8
Parameter Noise (Leq 24 hrs.)
Location ฝั่งกลางริ้วสวนพืชโตภายในโรงงาน (GPS 47P 0733219, 1438820)
Measurement Date Dec 06 - Dec 07, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 1120938

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	63.8	75.0	63.1
11:00 AM - 12:00 PM	64.1	75.5	63.2
12:00 PM - 01:00 PM	63.6	68.4	63.2
01:00 PM - 02:00 PM	63.5	72.3	63.1
02:00 PM - 03:00 PM	63.5	67.4	63.2
03:00 PM - 04:00 PM	63.5	66.7	63.1
04:00 PM - 05:00 PM	63.6	65.6	63.3
05:00 PM - 06:00 PM	63.8	68.5	63.3
06:00 PM - 07:00 PM	63.7	69.6	63.4
07:00 PM - 08:00 PM	64.1	83.8	63.3
08:00 PM - 09:00 PM	63.1	67.0	63.4
09:00 PM - 10:00 PM	63.8	66.7	63.5
10:00 PM - 11:00 PM	63.5	65.6	63.1
11:00 PM - 12:00 AM	63.2	72.1	62.7
12:00 AM - 01:00 AM	63.1	67.7	62.8
01:00 AM - 02:00 AM	63.2	65.2	62.9
02:00 AM - 03:00 AM	63.2	65.5	62.9
03:00 AM - 04:00 AM	63.2	67.0	62.8
04:00 AM - 05:00 AM	63.2	65.6	62.9
05:00 AM - 06:00 AM	63.7	65.5	63.4
06:00 AM - 07:00 AM	63.4	68.1	63.0
07:00 AM - 08:00 AM	64.1	76.2	63.4
08:00 AM - 09:00 AM	64.3	82.0	63.4
09:00 AM - 10:00 AM	63.2	75.1	63.2

Leq Average 24 hrs. (dB(A)) 63.6
Lmax (dB(A)) 83.8
L90 (dB(A)) 63.2
Ldn (dB(A)) 69.8
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supt S
Supt Salameth
Section Head

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S:\Reports\Air Noise rpt (3.39PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197571-1

Page 1 of 1

Sample Number 24136527-9
Parameter Noise (Leq 24 hrs.)
Location ฝั่งกลางริ้วสวนพืชโตภายในโรงงาน (GPS 47P 0733219, 1438820)
Measurement Date Dec 07 - Dec 08, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 1120938

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	63.8	75.9	63.3
11:00 AM - 12:00 PM	63.7	72.5	63.3
12:00 PM - 01:00 PM	63.7	73.5	63.2
01:00 PM - 02:00 PM	63.7	74.6	63.2
02:00 PM - 03:00 PM	64.0	74.6	63.2
03:00 PM - 04:00 PM	63.7	78.6	63.2
04:00 PM - 05:00 PM	63.7	74.5	63.2
05:00 PM - 06:00 PM	63.9	78.3	63.2
06:00 PM - 07:00 PM	63.8	76.7	63.1
07:00 PM - 08:00 PM	64.3	82.7	63.3
08:00 PM - 09:00 PM	63.8	66.8	63.5
09:00 PM - 10:00 PM	63.7	71.2	63.3
10:00 PM - 11:00 PM	63.9	74.1	63.5
11:00 PM - 12:00 AM	63.8	65.4	63.5
12:00 AM - 01:00 AM	63.8	67.3	63.5
01:00 AM - 02:00 AM	63.8	66.9	63.4
02:00 AM - 03:00 AM	63.7	65.6	63.4
03:00 AM - 04:00 AM	63.8	65.6	63.5
04:00 AM - 05:00 AM	63.7	65.4	63.4
05:00 AM - 06:00 AM	63.8	65.7	63.5
06:00 AM - 07:00 AM	63.9	66.9	63.6
07:00 AM - 08:00 AM	64.0	70.6	63.6
08:00 AM - 09:00 AM	64.0	67.1	63.6
09:00 AM - 10:00 AM	63.8	67.0	63.4

Leq Average 24 hrs. (dB(A)) 63.8
Lmax (dB(A)) 82.7
L90 (dB(A)) 63.4
Ldn (dB(A)) 70.2
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supt S
Supt Salameth
Section Head

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S:\Reports\Air Noise rpt (3.39PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197571-1

Page 1 of 1

Sample Number 24136527-10
Parameter Noise (Leq 24 hrs.)
Location ฝั่งกลางริ้วสวนพืชโตภายในโรงงาน (GPS 47P 0733219, 1438820)
Measurement Date Dec 08 - Dec 09, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 1120938

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	63.0	66.8	62.7
11:00 AM - 12:00 PM	63.2	66.4	62.9
12:00 PM - 01:00 PM	63.3	67.1	62.9
01:00 PM - 02:00 PM	63.8	66.2	63.5
02:00 PM - 03:00 PM	63.7	65.8	63.4
03:00 PM - 04:00 PM	63.8	65.7	63.5
04:00 PM - 05:00 PM	63.9	67.2	63.5
05:00 PM - 06:00 PM	63.8	66.4	63.5
06:00 PM - 07:00 PM	63.9	71.6	63.5
07:00 PM - 08:00 PM	64.3	70.4	63.6
08:00 PM - 09:00 PM	63.8	65.9	63.5
09:00 PM - 10:00 PM	63.7	68.4	63.4
10:00 PM - 11:00 PM	63.6	67.1	63.3
11:00 PM - 12:00 AM	63.2	66.5	62.9
12:00 AM - 01:00 AM	63.7	67.1	63.3
01:00 AM - 02:00 AM	63.1	67.8	62.7
02:00 AM - 03:00 AM	62.9	65.5	62.6
03:00 AM - 04:00 AM	62.9	65.0	62.4
04:00 AM - 05:00 AM	63.3	65.9	62.9
05:00 AM - 06:00 AM	63.2	66.7	62.9
06:00 AM - 07:00 AM	63.4	72.3	63.0
07:00 AM - 08:00 AM	63.5	66.8	63.0
08:00 AM - 09:00 AM	63.7	76.6	63.0
09:00 AM - 10:00 AM	63.7	75.8	63.2

Leq Average 24 hrs. (dB(A)) 63.5
Lmax (dB(A)) 76.6
L90 (dB(A)) 63.0
Ldn (dB(A)) 69.7
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

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S:\Reports\Air Noise rpt (3.42PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197575-1

Page 1 of 1

Sample Number 24136527-11
Parameter Noise (Leq 24 hrs.)
Location ฝั่งกลางริ้วสวนฟีดไอลาปนโรงงาน (GPS 47P 0733219, 1438820)
Measurement Date Dec 09 - Dec 10, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 1120938

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	63.9	76.4	62.9
11:00 AM - 12:00 PM	63.2	76.7	62.5
12:00 PM - 01:00 PM	63.2	80.1	62.0
01:00 PM - 02:00 PM	61.7	76.8	61.1
02:00 PM - 03:00 PM	63.0	79.6	62.3
03:00 PM - 04:00 PM	63.9	75.5	63.4
04:00 PM - 05:00 PM	64.0	73.8	63.4
05:00 PM - 06:00 PM	63.9	68.2	63.4
06:00 PM - 07:00 PM	63.9	66.9	63.5
07:00 PM - 08:00 PM	63.9	66.0	63.5
08:00 PM - 09:00 PM	63.8	66.1	63.5
09:00 PM - 10:00 PM	63.8	71.1	63.4
10:00 PM - 11:00 PM	63.3	66.0	63.0
11:00 PM - 12:00 AM	63.7	66.1	63.3
12:00 AM - 01:00 AM	63.3	65.7	63.0
01:00 AM - 02:00 AM	63.3	67.5	63.0
02:00 AM - 03:00 AM	63.3	65.4	63.0
03:00 AM - 04:00 AM	63.3	65.9	63.0
04:00 AM - 05:00 AM	63.4	65.1	63.1
05:00 AM - 06:00 AM	63.4	65.6	63.0
06:00 AM - 07:00 AM	63.5	70.3	63.2
07:00 AM - 08:00 AM	63.6	66.7	63.3
08:00 AM - 09:00 AM	63.6	76.8	63.1
09:00 AM - 10:00 AM	63.4	74.7	62.8

Leq Average 24 hrs. (dB(A)) 63.5
Lmax (dB(A)) 80.1
L90 (dB(A)) 63.0
Ldn (dB(A)) 69.8
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการ
โรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supt S
Supt Salameth
Section Head

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122-153/ ENAIL

S:\Reports_Air Noise ppt (3-43PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197576-1

Page 1 of 1

Sample Number 24136527-12
Parameter Noise (Leq 24 hrs.)
Location ฝั่งกลางริ้วสวนฟีดไอลาปนโรงงาน (GPS 47P 0733219, 1438820)
Measurement Date Dec 10 - Dec 11, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 1120938

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	63.2	73.9	62.7
11:00 AM - 12:00 PM	63.0	73.6	62.6
12:00 PM - 01:00 PM	63.1	77.0	62.5
01:00 PM - 02:00 PM	63.4	68.3	62.9
02:00 PM - 03:00 PM	63.6	80.0	63.0
03:00 PM - 04:00 PM	63.5	79.9	62.8
04:00 PM - 05:00 PM	63.5	76.1	62.9
05:00 PM - 06:00 PM	63.4	69.0	62.8
06:00 PM - 07:00 PM	63.8	68.7	63.3
07:00 PM - 08:00 PM	63.7	68.9	63.2
08:00 PM - 09:00 PM	63.2	67.4	62.7
09:00 PM - 10:00 PM	63.5	67.7	63.0
10:00 PM - 11:00 PM	63.7	67.0	63.3
11:00 PM - 12:00 AM	63.8	67.4	63.3
12:00 AM - 01:00 AM	63.3	70.8	62.9
01:00 AM - 02:00 AM	63.5	67.1	63.0
02:00 AM - 03:00 AM	63.1	66.7	62.5
03:00 AM - 04:00 AM	63.4	66.7	62.9
04:00 AM - 05:00 AM	63.1	67.0	62.6
05:00 AM - 06:00 AM	63.2	66.7	62.7
06:00 AM - 07:00 AM	63.3	69.4	62.8
07:00 AM - 08:00 AM	63.3	75.1	62.7
08:00 AM - 09:00 AM	62.3	77.3	61.4
09:00 AM - 10:00 AM	63.8	70.6	59.7

Leq Average 24 hrs. (dB(A)) 63.3
Lmax (dB(A)) 80.0
L90 (dB(A)) 62.8
Ldn (dB(A)) 69.8
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการ
โรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

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Supt Salameth
Section Head

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S:\Reports_Air Noise ppt (3-43PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197577-1

Page 1 of 1

Sample Number 24136527-13
Parameter Noise (Leq 24 hrs.)
Location ฝั่งกลางริ้วสวนฟีดไอลาปนโรงงาน (GPS 47P 0733219, 1438820)
Measurement Date Dec 11 - Dec 12, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 1120938

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	60.2	75.1	59.5
11:00 AM - 12:00 PM	62.3	85.2	59.8
12:00 PM - 01:00 PM	60.7	83.1	59.4
01:00 PM - 02:00 PM	60.3	81.2	59.3
02:00 PM - 03:00 PM	60.5	78.8	59.3
03:00 PM - 04:00 PM	60.2	75.0	59.2
04:00 PM - 05:00 PM	59.6	74.3	58.9
05:00 PM - 06:00 PM	60.1	69.5	59.6
06:00 PM - 07:00 PM	59.9	74.8	59.1
07:00 PM - 08:00 PM	60.2	67.9	60.8
08:00 PM - 09:00 PM	60.3	65.3	59.9
09:00 PM - 10:00 PM	62.1	66.7	61.6
10:00 PM - 11:00 PM	62.3	64.9	62.0
11:00 PM - 12:00 AM	62.3	67.4	62.0
12:00 AM - 01:00 AM	62.4	66.5	62.1
01:00 AM - 02:00 AM	62.4	66.1	62.0
02:00 AM - 03:00 AM	62.6	64.3	62.3
03:00 AM - 04:00 AM	62.5	67.1	62.0
04:00 AM - 05:00 AM	63.1	67.3	62.6
05:00 AM - 06:00 AM	63.8	74.2	63.3
06:00 AM - 07:00 AM	63.9	73.4	63.4
07:00 AM - 08:00 AM	63.8	78.6	63.3
08:00 AM - 09:00 AM	64.1	70.2	63.5
09:00 AM - 10:00 AM	64.0	77.2	63.3

Leq Average 24 hrs. (dB(A)) 62.1
Lmax (dB(A)) 85.2
L90 (dB(A)) 61.6
Ldn (dB(A)) 69.1
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการ
โรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supt S
Supt Salameth
Section Head

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S:\Reports_Air Noise ppt (3-43PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197578-1

Page 1 of 1

Sample Number 24136527-14
Parameter Noise (Leq 24 hrs.)
Location ฝั่งกลางริ้วสวนฟีดไอลาปนโรงงาน (GPS 47P 0733219, 1438820)
Measurement Date Dec 12 - Dec 13, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 1120938

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	63.9	77.3	63.2
11:00 AM - 12:00 PM	63.9	76.7	63.2
12:00 PM - 01:00 PM	63.8	77.6	63.2
01:00 PM - 02:00 PM	63.7	71.3	63.2
02:00 PM - 03:00 PM	63.8	75.3	63.2
03:00 PM - 04:00 PM	63.8	80.4	63.2
04:00 PM - 05:00 PM	63.7	67.7	63.2
05:00 PM - 06:00 PM	64.0	72.9	63.4
06:00 PM - 07:00 PM	63.7	74.2	63.2
07:00 PM - 08:00 PM	63.6	70.7	63.1
08:00 PM - 09:00 PM	63.6	67.8	63.1
09:00 PM - 10:00 PM	63.5	70.4	63.0
10:00 PM - 11:00 PM	63.5	69.7	63.1
11:00 PM - 12:00 AM	63.5	67.6	63.1
12:00 AM - 01:00 AM	63.5	67.8	63.1
01:00 AM - 02:00 AM	63.4	67.6	63.0
02:00 AM - 03:00 AM	63.5	68.2	63.1
03:00 AM - 04:00 AM	63.6	68.0	63.1
04:00 AM - 05:00 AM	63.1	67.9	63.1
05:00 AM - 06:00 AM	63.6	68.0	63.2
06:00 AM - 07:00 AM	63.8	77.0	63.2
07:00 AM - 08:00 AM	64.0	71.1	63.5
08:00 AM - 09:00 AM	64.2	74.6	63.5
09:00 AM - 10:00 AM	64.0	72.6	63.5

Leq Average 24 hrs. (dB(A)) 63.7
Lmax (dB(A)) 80.4
L90 (dB(A)) 63.2
Ldn (dB(A)) 70.0
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการ
โรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supt S
Supt Salameth
Section Head

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S:\Reports_Air Noise ppt (3-43PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197579-1

Page 1 of 1

Sample Number 24136527-15

Parameter Noise (Leq 24 hrs.)

Location ฟังกลางรั้วด้านทิศตะวันตกภายในโรงงาน (GPS 47P 0733052, 1438860)

Measurement Date Dec 06 - Dec 07, 2024

Measurement by Chatchai Sukpia

Sound Level meter Serial No. 1120936

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	61.2	89.3	59.3
11:00 AM - 12:00 PM	61.4	84.0	59.0
12:00 PM - 01:00 PM	60.2	71.0	59.0
01:00 PM - 02:00 PM	60.0	73.8	58.9
02:00 PM - 03:00 PM	60.3	74.8	59.0
03:00 PM - 04:00 PM	60.4	79.2	58.9
04:00 PM - 05:00 PM	60.7	70.4	59.6
05:00 PM - 06:00 PM	61.1	72.9	59.7
06:00 PM - 07:00 PM	61.1	72.2	59.8
07:00 PM - 08:00 PM	61.3	74.4	59.9
08:00 PM - 09:00 PM	61.7	71.9	60.6
09:00 PM - 10:00 PM	61.7	79.1	60.2
10:00 PM - 11:00 PM	61.2	76.8	60.0
11:00 PM - 12:00 AM	62.9	86.5	60.2
12:00 AM - 01:00 AM	61.4	74.7	60.3
01:00 AM - 02:00 AM	61.2	72.4	60.2
02:00 AM - 03:00 AM	61.4	75.4	60.4
03:00 AM - 04:00 AM	60.7	76.1	59.8
04:00 AM - 05:00 AM	60.7	69.9	59.8
05:00 AM - 06:00 AM	61.4	70.5	60.3
06:00 AM - 07:00 AM	61.6	71.5	60.5
07:00 AM - 08:00 AM	62.1	73.9	60.7
08:00 AM - 09:00 AM	61.8	79.3	60.0
09:00 AM - 10:00 AM	61.4	81.1	59.8

Leq Average 24 hrs. (dB(A))

Lmax (dB(A))

L90 (dB(A))

Ldn (dB(A))

Standard (dB(A))

Reference Method : ISO1996-1 and 1996-2

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

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

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supt S
Supt Salameth
Section Head

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S:\Reports_Air Noise rpt (3.44PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197580-1

Page 1 of 1

Sample Number 24136527-16

Parameter Noise (Leq 24 hrs.)

Location ฟังกลางรั้วด้านทิศตะวันตกภายในโรงงาน (GPS 47P 0733052, 1438860)

Measurement Date Dec 07 - Dec 08, 2024

Measurement by Chatchai Sukpia

Sound Level meter Serial No. 1120936

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	60.8	77.5	59.3
11:00 AM - 12:00 PM	60.5	87.7	58.8
12:00 PM - 01:00 PM	60.3	80.5	58.7
01:00 PM - 02:00 PM	60.3	81.1	58.6
02:00 PM - 03:00 PM	60.3	78.0	58.9
03:00 PM - 04:00 PM	60.6	78.3	58.9
04:00 PM - 05:00 PM	60.7	74.5	59.4
05:00 PM - 06:00 PM	61.6	78.2	59.5
06:00 PM - 07:00 PM	61.6	81.1	59.6
07:00 PM - 08:00 PM	61.4	75.7	59.7
08:00 PM - 09:00 PM	61.4	77.6	59.9
09:00 PM - 10:00 PM	62.3	79.3	60.3
10:00 PM - 11:00 PM	62.3	81.4	60.1
11:00 PM - 12:00 AM	61.3	70.8	60.3
12:00 AM - 01:00 AM	61.7	75.0	60.2
01:00 AM - 02:00 AM	62.6	83.1	59.7
02:00 AM - 03:00 AM	60.3	69.3	59.4
03:00 AM - 04:00 AM	60.3	72.0	59.5
04:00 AM - 05:00 AM	60.6	72.8	59.5
05:00 AM - 06:00 AM	60.6	69.9	59.6
06:00 AM - 07:00 AM	60.4	69.7	59.5
07:00 AM - 08:00 AM	61.2	73.3	60.0
08:00 AM - 09:00 AM	61.4	71.9	60.0
09:00 AM - 10:00 AM	60.3	70.0	59.1

Leq Average 24 hrs. (dB(A))

Lmax (dB(A))

L90 (dB(A))

Ldn (dB(A))

Standard (dB(A))

Reference Method : ISO1996-1 and 1996-2

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

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

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

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Supt Salameth
Section Head

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S:\Reports_Air Noise rpt (3.44PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197581-1

Page 1 of 1

Sample Number 24136527-17

Parameter Noise (Leq 24 hrs.)

Location ฟังกลางรั้วด้านทิศตะวันตกภายในโรงงาน (GPS 47P 0733052, 1438860)

Measurement Date Dec 08 - Dec 09, 2024

Measurement by Chatchai Sukpia

Sound Level meter Serial No. 1120936

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	60.4	69.6	59.3
11:00 AM - 12:00 PM	60.7	68.0	59.5
12:00 PM - 01:00 PM	60.7	75.2	59.5
01:00 PM - 02:00 PM	60.6	70.3	59.6
02:00 PM - 03:00 PM	60.6	75.0	59.2
03:00 PM - 04:00 PM	60.3	69.9	59.2
04:00 PM - 05:00 PM	60.7	75.5	59.5
05:00 PM - 06:00 PM	61.2	74.4	59.8
06:00 PM - 07:00 PM	61.0	71.3	59.8
07:00 PM - 08:00 PM	60.2	76.0	60.9
08:00 PM - 09:00 PM	65.6	71.9	64.0
09:00 PM - 10:00 PM	65.9	72.9	65.3
10:00 PM - 11:00 PM	66.3	71.3	65.8
11:00 PM - 12:00 AM	65.9	75.7	65.3
12:00 AM - 01:00 AM	61.1	73.3	59.6
01:00 AM - 02:00 AM	60.4	75.2	59.3
02:00 AM - 03:00 AM	59.6	72.8	58.8
03:00 AM - 04:00 AM	60.6	72.4	59.6
04:00 AM - 05:00 AM	60.5	77.4	59.6
05:00 AM - 06:00 AM	60.7	69.8	59.6
06:00 AM - 07:00 AM	61.1	70.0	59.9
07:00 AM - 08:00 AM	62.0	71.7	60.4
08:00 AM - 09:00 AM	61.8	71.7	60.4
09:00 AM - 10:00 AM	61.7	79.8	60.4

Leq Average 24 hrs. (dB(A))

Lmax (dB(A))

L90 (dB(A))

Ldn (dB(A))

Standard (dB(A))

Reference Method : ISO1996-1 and 1996-2

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

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

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supt S
Supt Salameth
Section Head

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122-153/ ENAIL

S:\Reports_Air Noise rpt (3.44PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197582-1

Page 1 of 1

Sample Number 24136527-18

Parameter Noise (Leq 24 hrs.)

Location ฟังกลางรั้วด้านทิศตะวันตกภายในโรงงาน (GPS 47P 0733052, 1438860)

Measurement Date Dec 09 - Dec 10, 2024

Measurement by Chatchai Sukpia

Sound Level meter Serial No. 1120936

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	61.3	86.9	59.7
11:00 AM - 12:00 PM	61.3	78.9	58.7
12:00 PM - 01:00 PM	59.7	79.4	58.4
01:00 PM - 02:00 PM	60.9	86.1	59.3
02:00 PM - 03:00 PM	60.6	69.4	59.4
03:00 PM - 04:00 PM	61.4	78.8	59.4
04:00 PM - 05:00 PM	61.1	74.4	59.7
05:00 PM - 06:00 PM	61.2	73.5	59.8
06:00 PM - 07:00 PM	61.4	76.5	60.1
07:00 PM - 08:00 PM	61.3	76.0	60.0
08:00 PM - 09:00 PM	61.5	76.1	59.9
09:00 PM - 10:00 PM	61.1	74.4	59.7
10:00 PM - 11:00 PM	61.3	77.7	59.9
11:00 PM - 12:00 AM	60.7	76.3	59.6
12:00 AM - 01:00 AM	61.7	85.1	59.8
01:00 AM - 02:00 AM	60.8	72.0	59.7
02:00 AM - 03:00 AM	60.7	69.5	59.6
03:00 AM - 04:00 AM	60.4	64.4	59.5
04:00 AM - 05:00 AM	60.9	65.7	60.0
05:00 AM - 06:00 AM	60.9	71.2	59.8
06:00 AM - 07:00 AM	61.3	74.4	59.9
07:00 AM - 08:00 AM	62.7	90.2	61.1
08:00 AM - 09:00 AM	61.7	80.0	60.1
09:00 AM - 10:00 AM	61.1	85.8	59.4

Leq Average 24 hrs. (dB(A))

Lmax (dB(A))

L90 (dB(A))

Ldn (dB(A))

Standard (dB(A))

Reference Method : ISO1996-1 and 1996-2

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

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

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supt S
Supt Salameth
Section Head

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122-153/ ENAIL

S:\Reports_Air Noise rpt (3.45PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197583-1

Page 1 of 1

Sample Number 24136527-19

Parameter Noise (Leq 24 hrs.)

Location ฝั่งกลางริ้วสวนพืชผลบริเวณภายในโรงงาน (GPS 47P 0733052, 1438860)

Measurement Date Dec 10 - Dec 11, 2024

Measurement by Chatchai Sukpia

Sound Level meter Serial No. 1120936

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	60.6	77.7	59.1
11:00 AM - 12:00 PM	60.6	70.2	59.6
12:00 PM - 01:00 PM	60.5	73.2	59.3
01:00 PM - 02:00 PM	60.5	74.3	59.5
02:00 PM - 03:00 PM	60.6	75.2	59.3
03:00 PM - 04:00 PM	60.5	71.7	59.2
04:00 PM - 05:00 PM	60.9	72.3	59.7
05:00 PM - 06:00 PM	61.4	73.6	60.0
06:00 PM - 07:00 PM	61.3	77.4	59.9
07:00 PM - 08:00 PM	62.0	75.7	60.4
08:00 PM - 09:00 PM	62.1	74.3	60.5
09:00 PM - 10:00 PM	61.9	74.0	60.5
10:00 PM - 11:00 PM	61.2	74.8	60.1
11:00 PM - 12:00 AM	61.1	72.1	60.2
12:00 AM - 01:00 AM	61.1	71.0	60.2
01:00 AM - 02:00 AM	61.0	71.0	60.2
02:00 AM - 03:00 AM	60.3	67.8	59.3
03:00 AM - 04:00 AM	60.3	68.1	59.4
04:00 AM - 05:00 AM	60.7	67.0	59.7
05:00 AM - 06:00 AM	60.9	73.7	59.8
06:00 AM - 07:00 AM	60.8	76.7	59.7
07:00 AM - 08:00 AM	61.9	74.0	60.5
08:00 AM - 09:00 AM	61.1	74.4	59.4
09:00 AM - 10:00 AM	60.3	70.4	59.1

Leq Average 24 hrs. (dB(A))

61.0

Lmax (dB(A))

77.7

L90 (dB(A))

59.7

Ldn (dB(A))

67.3

Standard (dB(A))

70

115

Reference Method : ISO1996-1 and 1996-2

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

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

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot Salameth
Section Head

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S:\Reports_Air Noise rpt (3.45PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197584-1

Page 1 of 1

Sample Number 24136527-20

Parameter Noise (Leq 24 hrs.)

Location ฝั่งกลางริ้วสวนพืชผลบริเวณภายในโรงงาน (GPS 47P 0733052, 1438860)

Measurement Date Dec 11 - Dec 12, 2024

Measurement by Chatchai Sukpia

Sound Level meter Serial No. 1120936

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	60.1	74.9	59.0
11:00 AM - 12:00 PM	59.9	71.3	58.7
12:00 PM - 01:00 PM	60.6	87.8	58.5
01:00 PM - 02:00 PM	59.8	78.8	58.6
02:00 PM - 03:00 PM	60.0	75.8	58.8
03:00 PM - 04:00 PM	60.0	75.5	58.3
04:00 PM - 05:00 PM	60.8	83.7	59.0
05:00 PM - 06:00 PM	60.8	72.5	59.1
06:00 PM - 07:00 PM	60.8	76.2	59.3
07:00 PM - 08:00 PM	60.8	77.8	59.3
08:00 PM - 09:00 PM	61.0	71.1	59.6
09:00 PM - 10:00 PM	60.6	71.7	59.3
10:00 PM - 11:00 PM	59.9	66.7	59.1
11:00 PM - 12:00 AM	59.8	72.0	59.0
12:00 AM - 01:00 AM	59.9	70.3	58.8
01:00 AM - 02:00 AM	59.7	72.0	58.7
02:00 AM - 03:00 AM	59.8	68.3	59.1
03:00 AM - 04:00 AM	59.9	68.5	59.1
04:00 AM - 05:00 AM	60.2	68.6	59.4
05:00 AM - 06:00 AM	60.8	78.1	59.6
06:00 AM - 07:00 AM	61.3	74.8	60.1
07:00 AM - 08:00 AM	62.0	70.9	60.8
08:00 AM - 09:00 AM	62.1	75.1	60.5
09:00 AM - 10:00 AM	62.7	80.2	60.7

Leq Average 24 hrs. (dB(A))

60.6

Lmax (dB(A))

87.8

L90 (dB(A))

59.1

Ldn (dB(A))

66.7

Standard (dB(A))

70

115

Reference Method : ISO1996-1 and 1996-2

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

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

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot Salameth
Section Head

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122-153/ ENAL

S:\Reports_Air Noise rpt (3.45PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197585-1

Page 1 of 1

Sample Number 24136527-21

Parameter Noise (Leq 24 hrs.)

Location ฝั่งกลางริ้วสวนพืชผลบริเวณภายในโรงงาน (GPS 47P 0733052, 1438860)

Measurement Date Dec 12 - Dec 13, 2024

Measurement by Chatchai Sukpia

Sound Level meter Serial No. 1120936

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	61.5	81.2	60.2
11:00 AM - 12:00 PM	61.1	71.0	60.0
12:00 PM - 01:00 PM	61.2	76.9	59.8
01:00 PM - 02:00 PM	64.5	69.2	60.9
02:00 PM - 03:00 PM	65.6	72.1	63.5
03:00 PM - 04:00 PM	66.1	79.4	65.3
04:00 PM - 05:00 PM	66.1	71.1	65.4
05:00 PM - 06:00 PM	65.5	77.5	64.6
06:00 PM - 07:00 PM	61.3	75.4	60.1
07:00 PM - 08:00 PM	61.5	74.9	60.1
08:00 PM - 09:00 PM	61.9	78.0	60.2
09:00 PM - 10:00 PM	61.2	76.0	60.0
10:00 PM - 11:00 PM	60.0	74.0	60.0
11:00 PM - 12:00 AM	60.5	72.2	59.7
12:00 AM - 01:00 AM	60.7	68.8	59.9
01:00 AM - 02:00 AM	60.6	68.6	59.8
02:00 AM - 03:00 AM	60.7	73.2	59.7
03:00 AM - 04:00 AM	60.8	67.8	59.7
04:00 AM - 05:00 AM	60.9	71.0	59.8
05:00 AM - 06:00 AM	60.7	74.5	59.6
06:00 AM - 07:00 AM	60.6	74.5	59.4
07:00 AM - 08:00 AM	61.9	76.4	60.4
08:00 AM - 09:00 AM	61.7	73.8	60.2
09:00 AM - 10:00 AM	61.1	76.4	59.9

Leq Average 24 hrs. (dB(A))

62.5

Lmax (dB(A))

81.2

L90 (dB(A))

60.0

Ldn (dB(A))

67.6

Standard (dB(A))

70

115

Reference Method : ISO1996-1 and 1996-2

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

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

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot Salameth
Section Head

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S:\Reports_Air Noise rpt (3.45PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197586-1

Page 1 of 1

Sample Number 24136527-22

Parameter Noise (Leq 24 hrs.)

Location ฝั่งกลางริ้วสวนพืชผลบริเวณภายในโรงงาน (GPS 47P 0733267, 1438947)

Measurement Date Dec 06 - Dec 07, 2024

Measurement by Chatchai Sukpia

Sound Level meter Serial No. 1120937

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	54.4	82.6	50.2
11:00 AM - 12:00 PM	52.7	69.4	50.5
12:00 PM - 01:00 PM	50.7	74.5	49.3
01:00 PM - 02:00 PM	51.7	64.7	50.1
02:00 PM - 03:00 PM	53.2	65.3	51.4
03:00 PM - 04:00 PM	52.9	66.0	51.2
04:00 PM - 05:00 PM	55.3	70.8	53.7
05:00 PM - 06:00 PM	51.8	63.9	50.4
06:00 PM - 07:00 PM	52.2	67.0	50.8
07:00 PM - 08:00 PM	52.7	74.9	51.3
08:00 PM - 09:00 PM	53.6	68.2	52.5
09:00 PM - 10:00 PM	54.8	72.8	53.4
10:00 PM - 11:00 PM	54.3	62.5	53.0
11:00 PM - 12:00 AM	55.2	78.1	53.3
12:00 AM - 01:00 AM	54.8	62.9	53.3
01:00 AM - 02:00 AM	54.2	65.0	52.9
02:00 AM - 03:00 AM	54.9	65.4	53.5
03:00 AM - 04:00 AM	52.9	66.2	51.9
04:00 AM - 05:00 AM	54.3	65.9	52.9
05:00 AM - 06:00 AM	55.8	67.5	53.9
06:00 AM - 07:00 AM	53.1	62.1	52.0
07:00 AM - 08:00 AM	54.7	63.2	53.2
08:00 AM - 09:00 AM	53.3	74.1	51.8
09:00 AM - 10:00 AM	52.9	71.5	51.7

Leq Average 24 hrs. (dB(A))

53.8

Lmax (dB(A))

82.6

L90 (dB(A))

51.9

Ldn (dB(A))

60.7

Standard (dB(A))

70</



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197587-1

Page 1 of 1

Sample Number 24136527-23
Parameter Noise (Leq 24 hrs.)
Location ฝั่งกลางริ้วสวนพืชและบริเวณถนนในโรงงาน (GPS 47P 0733267, 1438947)
Measurement Date Dec 07 - Dec 08, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 1120937

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	52.0	64.6	50.5
11:00 AM - 12:00 PM	51.6	64.7	49.9
12:00 PM - 01:00 PM	49.7	62.8	48.4
01:00 PM - 02:00 PM	51.5	72.1	49.8
02:00 PM - 03:00 PM	59.5	78.2	50.5
03:00 PM - 04:00 PM	52.1	68.2	50.6
04:00 PM - 05:00 PM	53.0	63.6	53.0
05:00 PM - 06:00 PM	53.2	64.0	51.7
06:00 PM - 07:00 PM	54.5	65.9	52.8
07:00 PM - 08:00 PM	53.7	73.8	52.1
08:00 PM - 09:00 PM	53.4	65.3	52.1
09:00 PM - 10:00 PM	56.0	70.8	54.0
10:00 PM - 11:00 PM	56.4	78.4	53.9
11:00 PM - 12:00 AM	54.5	63.5	53.3
12:00 AM - 01:00 AM	54.7	62.2	53.0
01:00 AM - 02:00 AM	54.6	68.2	52.6
02:00 AM - 03:00 AM	53.7	66.8	52.3
03:00 AM - 04:00 AM	52.5	60.7	51.7
04:00 AM - 05:00 AM	52.3	63.5	51.2
05:00 AM - 06:00 AM	53.2	62.4	51.6
06:00 AM - 07:00 AM	51.3	61.7	50.2
07:00 AM - 08:00 AM	52.0	64.3	50.6
08:00 AM - 09:00 AM	51.4	70.3	49.5
09:00 AM - 10:00 AM	49.7	63.8	48.4

Leq Average 24 hrs. (dB(A)) 53.8
Lmax (dB(A)) 78.4
L90 (dB(A)) 51.6
Ldn (dB(A)) 60.3
Standard (dB(A)) 70
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supt S
Supt Salameth
Section Head

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122-153/ ENAIL

S:\Reports\Air Noise ppt (3-48PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197588-1

Page 1 of 1

Sample Number 24136527-24
Parameter Noise (Leq 24 hrs.)
Location ฝั่งกลางริ้วสวนพืชและบริเวณถนนในโรงงาน (GPS 47P 0733267, 1438947)
Measurement Date Dec 08 - Dec 09, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 1120937

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	49.2	64.9	47.8
11:00 AM - 12:00 PM	49.1	64.2	47.8
12:00 PM - 01:00 PM	49.0	63.5	47.6
01:00 PM - 02:00 PM	49.4	66.6	47.9
02:00 PM - 03:00 PM	49.8	64.8	48.4
03:00 PM - 04:00 PM	49.7	65.4	48.2
04:00 PM - 05:00 PM	50.1	65.3	48.3
05:00 PM - 06:00 PM	50.1	64.2	48.8
06:00 PM - 07:00 PM	50.0	64.7	48.5
07:00 PM - 08:00 PM	50.8	64.0	49.6
08:00 PM - 09:00 PM	50.5	71.8	49.1
09:00 PM - 10:00 PM	49.8	62.6	48.8
10:00 PM - 11:00 PM	51.1	62.4	50.1
11:00 PM - 12:00 AM	49.9	60.3	48.8
12:00 AM - 01:00 AM	49.5	64.0	48.1
01:00 AM - 02:00 AM	49.0	63.2	47.7
02:00 AM - 03:00 AM	48.9	61.2	47.5
03:00 AM - 04:00 AM	49.9	67.0	47.9
04:00 AM - 05:00 AM	50.5	65.0	48.6
05:00 AM - 06:00 AM	50.5	73.2	48.8
06:00 AM - 07:00 AM	50.7	64.4	49.3
07:00 AM - 08:00 AM	51.6	61.5	50.3
08:00 AM - 09:00 AM	52.4	66.1	50.6
09:00 AM - 10:00 AM	53.5	73.2	51.7

Leq Average 24 hrs. (dB(A)) 50.4
Lmax (dB(A)) 73.2
L90 (dB(A)) 48.5
Ldn (dB(A)) 56.6
Standard (dB(A)) 70
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supt S
Supt Salameth
Section Head

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122-153/ ENAIL

S:\Reports\Air Noise ppt (3-48PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197589-1

Page 1 of 1

Sample Number 24136527-25
Parameter Noise (Leq 24 hrs.)
Location ฝั่งกลางริ้วสวนพืชและบริเวณถนนในโรงงาน (GPS 47P 0733267, 1438947)
Measurement Date Dec 09 - Dec 10, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 1120937

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	53.1	68.4	51.5
11:00 AM - 12:00 PM	53.1	67.5	51.5
12:00 PM - 01:00 PM	52.3	65.3	51.0
01:00 PM - 02:00 PM	54.2	76.8	51.9
02:00 PM - 03:00 PM	53.7	64.3	52.2
03:00 PM - 04:00 PM	52.6	63.9	51.2
04:00 PM - 05:00 PM	54.9	74.2	52.2
05:00 PM - 06:00 PM	52.5	67.4	51.2
06:00 PM - 07:00 PM	54.0	63.5	52.4
07:00 PM - 08:00 PM	54.7	70.5	52.4
08:00 PM - 09:00 PM	53.3	70.3	52.1
09:00 PM - 10:00 PM	54.9	72.3	52.9
10:00 PM - 11:00 PM	55.1	65.7	53.4
11:00 PM - 12:00 AM	53.5	66.1	52.3
12:00 AM - 01:00 AM	54.6	67.5	52.9
01:00 AM - 02:00 AM	54.0	67.9	52.4
02:00 AM - 03:00 AM	54.9	67.8	53.2
03:00 AM - 04:00 AM	52.3	65.5	51.4
04:00 AM - 05:00 AM	52.6	68.4	51.3
05:00 AM - 06:00 AM	53.6	69.5	52.3
06:00 AM - 07:00 AM	53.2	67.1	51.8
07:00 AM - 08:00 AM	54.5	66.1	53.0
08:00 AM - 09:00 AM	52.5	64.3	51.3
09:00 AM - 10:00 AM	54.0	66.1	52.2

Leq Average 24 hrs. (dB(A)) 53.7
Lmax (dB(A)) 76.8
L90 (dB(A)) 52.2
Ldn (dB(A)) 60.2
Standard (dB(A)) 70
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supt S
Supt Salameth
Section Head

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S:\Reports\Air Noise ppt (3-48PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197590-1

Page 1 of 1

Sample Number 24136527-26
Parameter Noise (Leq 24 hrs.)
Location ฝั่งกลางริ้วสวนพืชและบริเวณถนนในโรงงาน (GPS 47P 0733267, 1438947)
Measurement Date Dec 10 - Dec 11, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 1120937

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	54.7	77.5	51.9
11:00 AM - 12:00 PM	54.7	63.8	51.8
12:00 PM - 01:00 PM	51.8	73.7	50.4
01:00 PM - 02:00 PM	53.3	63.8	51.3
02:00 PM - 03:00 PM	54.6	70.0	52.6
03:00 PM - 04:00 PM	52.7	73.9	51.0
04:00 PM - 05:00 PM	55.5	66.1	53.5
05:00 PM - 06:00 PM	53.1	68.8	51.7
06:00 PM - 07:00 PM	56.0	68.1	54.1
07:00 PM - 08:00 PM	55.5	65.8	54.0
08:00 PM - 09:00 PM	55.5	75.4	53.8
09:00 PM - 10:00 PM	56.6	72.3	54.7
10:00 PM - 11:00 PM	56.3	68.7	54.6
11:00 PM - 12:00 AM	55.5	65.8	54.0
12:00 AM - 01:00 AM	56.6	63.9	54.8
01:00 AM - 02:00 AM	55.7	64.5	54.1
02:00 AM - 03:00 AM	55.2	65.7	53.7
03:00 AM - 04:00 AM	53.2	62.4	52.4
04:00 AM - 05:00 AM	54.7	68.6	53.4
05:00 AM - 06:00 AM	55.8	66.3	54.1
06:00 AM - 07:00 AM	54.3	67.7	53.1
07:00 AM - 08:00 AM	55.0	66.5	53.5
08:00 AM - 09:00 AM	53.0	66.6	51.7
09:00 AM - 10:00 AM	52.8	74.2	51.2

Leq Average 24 hrs. (dB(A)) 54.7
Lmax (dB(A)) 77.5
L90 (dB(A)) 53.1
Ldn (dB(A)) 61.7
Standard (dB(A)) 70
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการประกอบกิจการโรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supt S
Supt Salameth
Section Head

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S:\Reports\Air Noise ppt (3-48PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197591-1

Page 1 of 1

Sample Number 24136527-27
Parameter Noise (Leq 24 hrs.)
Location ห้องกลางสำนักงานและบริเวณภายในโรงงาน (GPS 47P 0733267, 1438947)
Measurement Date Dec 11 - Dec 12, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 1120937

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	51.7	82.7	49.8
11:00 AM - 12:00 PM	52.4	66.8	50.4
12:00 PM - 01:00 PM	50.9	70.5	49.0
01:00 PM - 02:00 PM	52.0	69.6	49.7
02:00 PM - 03:00 PM	53.8	76.7	51.3
03:00 PM - 04:00 PM	52.1	67.4	50.1
04:00 PM - 05:00 PM	53.9	64.1	51.6
05:00 PM - 06:00 PM	51.5	64.9	49.7
06:00 PM - 07:00 PM	53.8	67.0	52.0
07:00 PM - 08:00 PM	53.2	62.4	52.4
08:00 PM - 09:00 PM	54.7	68.6	53.4
09:00 PM - 10:00 PM	55.8	66.3	54.1
10:00 PM - 11:00 PM	49.6	63.8	48.3
11:00 PM - 12:00 AM	49.3	64.9	47.9
12:00 AM - 01:00 AM	51.6	72.5	49.9
01:00 AM - 02:00 AM	51.8	82.7	49.9
02:00 AM - 03:00 AM	52.5	66.2	50.5
03:00 AM - 04:00 AM	53.8	67.4	51.7
04:00 AM - 05:00 AM	54.9	67.8	53.2
05:00 AM - 06:00 AM	54.1	67.0	52.6
06:00 AM - 07:00 AM	53.2	62.4	52.5
07:00 AM - 08:00 AM	53.7	68.6	52.4
08:00 AM - 09:00 AM	50.6	70.5	48.9
09:00 AM - 10:00 AM	51.8	69.6	49.5

Leq Average 24 hrs. (dB(A)) 52.9
Lmax (dB(A)) 82.7
L90 (dB(A)) 50.4
Ldn (dB(A)) 59.1
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการรบกวน
โรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot Salameth
Section Head

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S:\Reports_Air Noise rpt (3:46PM)



Analysis / Test Report



TESTING
No.0042

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136527

Date Received : Dec 16, 2024

Date Reported : Dec 19, 2024

Report Number: 3197592-1

Page 1 of 1

Sample Number 24136527-28
Parameter Noise (Leq 24 hrs.)
Location ห้องกลางสำนักงานและบริเวณภายในโรงงาน (GPS 47P 0733267, 1438947)
Measurement Date Dec 12 - Dec 13, 2024
Measurement by Chatchai Sukpia
Sound Level meter Serial No. 1120937

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	51.1	63.9	48.9
11:00 AM - 12:00 PM	53.2	69.6	50.7
12:00 PM - 01:00 PM	53.2	76.7	50.9
01:00 PM - 02:00 PM	52.5	67.4	50.4
02:00 PM - 03:00 PM	54.5	67.8	52.7
03:00 PM - 04:00 PM	54.5	65.5	52.9
04:00 PM - 05:00 PM	52.2	65.1	51.2
05:00 PM - 06:00 PM	53.2	68.4	51.7
06:00 PM - 07:00 PM	55.0	70.8	53.4
07:00 PM - 08:00 PM	51.6	63.4	50.0
08:00 PM - 09:00 PM	51.5	64.7	49.9
09:00 PM - 10:00 PM	52.8	67.4	50.6
10:00 PM - 11:00 PM	53.3	64.1	51.3
11:00 PM - 12:00 AM	52.1	64.8	50.4
12:00 AM - 01:00 AM	52.9	65.3	51.0
01:00 AM - 02:00 AM	51.3	64.9	49.3
02:00 AM - 03:00 AM	53.4	69.6	50.9
03:00 AM - 04:00 AM	52.9	76.7	50.7
04:00 AM - 05:00 AM	52.0	67.4	50.3
05:00 AM - 06:00 AM	51.3	65.7	49.7
06:00 AM - 07:00 AM	51.1	62.4	49.6
07:00 AM - 08:00 AM	52.6	65.3	50.8
08:00 AM - 09:00 AM	52.8	63.6	50.7
09:00 AM - 10:00 AM	52.1	67.0	50.2

Leq Average 24 hrs. (dB(A)) 52.8
Lmax (dB(A)) 76.7
L90 (dB(A)) 50.7
Ldn (dB(A)) 58.9
Standard (dB(A)) 70 115
Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เฝ้าระวังการรบกวน
โรงงาน พ.ศ. 2548
Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot Salameth
Section Head

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S:\Reports_Air Noise rpt (3:47PM)



Analysis / Test Report

Lot ID: 2490727

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Date Received : Aug 16, 2024

Date Reported : Aug 21, 2024

Report Number: 3088617-1

Page 1 of 1

Sample Number 2490727-1
Parameter Noise (Leq 12 hrs.)
Location Packing (1st Floor)
Measurement Date Aug 15, 2024
Measurement by Ronnachai Moungma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:29 AM - 09:29 AM	73.2	83.8	69.5
09:29 AM - 10:29 AM	70.5	84.6	64.4
10:29 AM - 11:29 AM	66.1	84.1	64.1
11:29 AM - 12:29 PM	78.5	99.5	62.9
12:29 PM - 01:29 PM	69.3	94.5	63.9
01:29 PM - 02:29 PM	69.8	87.7	63.1
02:29 PM - 03:29 PM	67.8	85.2	63.0
03:29 PM - 04:29 PM	70.4	95.5	63.2
04:29 PM - 05:29 PM	70.4	88.9	64.3
05:29 PM - 06:29 PM	67.2	85.2	65.2
06:29 PM - 07:29 PM	70.6	85.7	63.4
07:29 PM - 08:29 PM	70.6	89.1	64.5

Leq Average 12 hrs. (dB(A)) 71.8
Lmax (dB(A)) 99.5
Standard (dB(A)) 87 140
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการห้ามของกลางปลอม
ในการประกอบกิจการโรงงานเกี่ยวกับมาตรการเฝ้าระวังในการทำงาน พ.ศ.๒๕๖๓
Note : L_{peak} = 112.7 dB (C)

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot Salameth
Section Head

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ALS LABORATORY GROUP (THAILAND) CO., LTD. AN ALS Limited Company

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S:\Reports_Air Noise rpt (2:18PM)



Analysis / Test Report

Lot ID: 2490727

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Date Received : Aug 16, 2024

Date Reported : Aug 21, 2024

Report Number: 3088618-1

Page 1 of 1

Sample Number 2490727-2
Parameter Noise (Leq 12 hrs.)
Location Band Dryer Area (2nd Floor)
Measurement Date Aug 15, 2024
Measurement by Ronnachai Moungma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:30 AM - 09:30 AM	89.1	90.2	88.9
09:30 AM - 10:30 AM	90.1	91.2	89.7
10:30 AM - 11:30 AM	89.8	91.1	89.5
11:30 AM - 12:30 PM	89.7	90.9	89.4
12:30 PM - 01:30 PM	89.7	91.1	89.4
01:30 PM - 02:30 PM	89.8	90.8	89.5
02:30 PM - 03:30 PM	89.9	90.9	89.6
03:30 PM - 04:30 PM	89.9	91.0	89.6
04:30 PM - 05:30 PM	89.9	91.0	89.7
05:30 PM - 06:30 PM	90.0	91.0	89.7
06:30 PM - 07:30 PM	89.5	90.6	89.3
07:30 PM - 08:30 PM	89.6	90.6	89.3

Leq Average 12 hrs. (dB(A)) 89.8
Lmax (dB(A)) 91.2
Standard (dB(A)) 87 140
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการห้ามของกลางปลอม
ในการประกอบกิจการโรงงานเกี่ยวกับมาตรการเฝ้าระวังในการทำงาน พ.ศ.๒๕๖๓
Note : L_{peak} = 113.8 dB (C)

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot Salameth
Section Head

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Plauckdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
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RIGHT SOLUTIONS RIGHT PARTNER

122-153/ ENAIL

S:\Reports_Air Noise rpt (2:20PM)



Analysis / Test Report

Client : BASF (Thai) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490727
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number: 3088619-1

Page 1 of 1

Sample Number 2490727-3
Parameter Noise (Leq 12 hrs.)
Location Polybelt Area (3rd Floor)
Measurement Date Aug 15, 2024
Measurement by Ronnchai Moungma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:14 PM - 09:14 PM	78.8	82.2	78.6
09:14 PM - 10:14 PM	79.5	86.6	79.2
10:14 PM - 11:14 PM	79.8	86.7	79.6
11:14 PM - 12:14 AM	79.8	86.6	79.6
12:14 AM - 01:14 AM	79.8	86.5	79.6
01:14 AM - 02:14 AM	79.8	86.6	79.7
02:14 AM - 03:14 AM	79.8	86.6	79.7
03:14 AM - 04:14 AM	79.8	86.6	79.7
04:14 AM - 05:14 AM	79.8	86.5	79.7
05:14 AM - 06:14 AM	79.9	86.6	79.7
06:14 AM - 07:14 AM	79.8	86.5	79.6
07:14 AM - 08:14 AM	79.8	86.6	79.6

Leq Average 12 hrs. (dB(A)) 79.7
Lmax (dB(A)) 86.7
Standard (dB(A)) 87
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดของเสียงและสั่น
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Note : LCpeak = 102.7 dB (C)

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot Salameth
Section Head

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Analysis / Test Report

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Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490727
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number: 3088620-1

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Sample Number 2490727-4
Parameter Noise (Leq 12 hrs.)
Location Extruder 2 (2nd Floor) ชั่วถั่ว
Measurement Date Aug 15, 2024
Measurement by Ronnchai Moungma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:29 PM - 09:29 PM	89.4	90.5	89.2
09:29 PM - 10:29 PM	90.4	91.5	90.0
10:29 PM - 11:29 PM	89.8	91.1	89.5
11:29 PM - 12:29 AM	89.7	90.9	89.4
12:14 AM - 01:14 AM	89.7	91.1	89.4
01:29 AM - 02:29 AM	89.8	90.8	89.5
02:29 AM - 03:29 AM	89.9	90.9	89.6
03:29 AM - 04:29 AM	89.9	91.0	89.6
04:29 AM - 05:29 AM	89.9	91.0	89.7
05:29 AM - 06:29 AM	89.9	90.9	89.6
06:29 AM - 07:29 AM	89.8	90.9	89.6
07:29 AM - 08:29 AM	89.6	90.6	89.3

Leq Average 12 hrs. (dB(A)) 89.8
Lmax (dB(A)) 91.5
Standard (dB(A)) 87
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดของเสียงและสั่น
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Note : LCpeak = 119.9 dB (C)

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490727
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number: 3088621-1

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Sample Number 2490727-5
Parameter Noise (Leq 12 hrs.)
Location Product Surge Tank (2nd Floor)
Measurement Date Aug 15, 2024
Measurement by Ronnchai Moungma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:30 AM - 09:30 AM	81.5	82.9	81.2
09:30 AM - 10:30 AM	81.4	84.1	81.1
10:30 AM - 11:30 AM	81.2	82.4	80.9
11:30 AM - 12:30 PM	81.2	88.7	80.9
12:30 PM - 01:30 PM	81.4	90.2	81.1
01:30 PM - 02:30 PM	81.3	82.6	81.0
02:30 PM - 03:30 PM	81.3	82.7	81.0
03:30 PM - 04:30 PM	81.5	82.7	81.2
04:30 PM - 05:30 PM	81.6	82.7	81.3
05:30 PM - 06:30 PM	81.7	90.5	81.4
06:30 PM - 07:30 PM	81.6	82.9	81.3
07:30 PM - 08:30 PM	81.6	83.0	81.3

Leq Average 12 hrs. (dB(A)) 81.4
Lmax (dB(A)) 90.5
Standard (dB(A)) 87
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดของเสียงและสั่น
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Note : LCpeak = 102.9 dB (C)

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Project Name : Monitoring
Project Location :

Lot ID: 2490727
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number: 3088622-1

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Sample Number 2490727-6
Parameter Noise (Leq 12 hrs.)
Location Sifter room (3rd Floor)
Measurement Date Aug 15, 2024
Measurement by Ronnchai Moungma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:06 PM - 09:06 PM	83.3	86.7	83.1
09:06 PM - 10:06 PM	84.0	91.1	83.7
10:06 PM - 11:06 PM	84.3	91.2	84.1
11:06 PM - 12:06 AM	84.3	91.1	84.1
12:06 AM - 01:06 AM	84.3	91.0	84.1
01:06 AM - 02:06 AM	84.3	91.1	84.2
02:06 AM - 03:06 AM	84.3	91.1	84.2
03:06 AM - 04:06 AM	84.3	91.1	84.2
04:06 AM - 05:06 AM	84.3	91.0	84.2
05:06 AM - 06:06 AM	84.4	91.1	84.2
06:06 AM - 07:06 AM	84.3	91.0	84.1
07:06 AM - 08:06 AM	84.3	91.1	84.1

Leq Average 12 hrs. (dB(A)) 84.2
Lmax (dB(A)) 91.2
Standard (dB(A)) 87
Reference Method : ISO1996-1 and 1996-2
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดของเสียงและสั่น
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Note : LCpeak = 104.6 dB (C)

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P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 2490727

Date Received : Aug 16, 2024

Date Reported : Aug 21, 2024

Report Number: 3088623-1

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Sample Number 2490727-7
Parameter Noise (Leq 12 hrs.)
Location Rotex SZ 1080 (3rd Floor)
Measurement Date Aug 15, 2024
Measurement by Ronnachai Moungma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:59 PM - 09:59 PM	83.2	85.4	82.2
09:59 PM - 10:59 PM	83.0	85.5	82.0
10:59 PM - 11:59 PM	83.1	85.9	82.2
11:59 PM - 12:59 AM	83.1	85.9	82.1
12:59 AM - 01:59 AM	83.2	85.8	82.2
01:59 AM - 02:59 AM	83.4	86.1	82.4
02:59 AM - 03:59 AM	83.3	85.8	82.3
03:59 AM - 04:59 AM	83.4	86.2	82.5
04:59 AM - 05:59 AM	83.4	86.2	82.4
05:59 AM - 06:59 AM	83.5	86.1	82.5
06:59 AM - 07:59 AM	83.7	86.4	82.7
07:59 AM - 08:59 AM	83.6	86.1	82.6

Leq Average 12 hrs. (dB(A))

83.3

Lmax (dB(A))

86.4

Standard (dB(A))

87

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดของเสียงและสั่น

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Note : LCpeak = 103.5 dB (C)

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P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 2490727

Date Received : Aug 16, 2024

Date Reported : Aug 21, 2024

Report Number: 3088624-1

Page 1 of 1

Sample Number 2490727-8
Parameter Noise (Leq 12 hrs.)
Location K Tron PC1060 (3rd Floor)
Measurement Date Aug 15, 2024
Measurement by Ronnachai Moungma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:19 PM - 09:19 PM	83.3	85.5	82.3
09:19 PM - 10:19 PM	83.3	85.8	82.3
10:19 PM - 11:19 PM	83.3	86.1	82.4
11:19 PM - 12:19 AM	83.3	86.1	82.3
12:19 AM - 01:19 AM	83.4	86.0	82.4
01:19 AM - 02:19 AM	83.3	86.0	82.3
02:19 AM - 03:19 AM	83.2	85.7	82.2
03:19 AM - 04:19 AM	83.3	86.1	82.4
04:19 AM - 05:19 AM	83.3	86.1	82.3
05:19 AM - 06:19 AM	83.4	86.0	82.4
06:19 AM - 07:19 AM	83.6	86.3	82.6
07:19 AM - 08:19 AM	83.5	86.0	82.5

Leq Average 12 hrs. (dB(A))

83.4

Lmax (dB(A))

86.3

Standard (dB(A))

87

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดของเสียงและสั่น

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Note : LCpeak = 119.6 dB (C)

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P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 2490727

Date Received : Aug 16, 2024

Date Reported : Aug 21, 2024

Report Number: 3088625-1

Page 1 of 1

Sample Number 2490727-9
Parameter Noise (Leq 12 hrs.)
Location Control Room (1st Floor)
Measurement Date Aug 15, 2024
Measurement by Ronnachai Moungma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:36 AM - 09:36 AM	62.9	81.0	53.6
09:36 AM - 10:36 AM	63.9	81.5	52.9
10:36 AM - 11:36 AM	64.7	83.4	52.5
11:36 AM - 12:36 PM	61.6	75.6	52.3
12:36 PM - 01:36 PM	60.3	76.9	52.9
01:36 PM - 02:36 PM	62.6	88.6	53.2
02:36 PM - 03:36 PM	64.7	87.3	53.4
03:36 PM - 04:36 PM	66.4	82.6	54.2
04:36 PM - 05:36 PM	62.6	80.7	53.3
05:36 PM - 06:36 PM	64.2	85.5	53.5
06:36 PM - 07:36 PM	65.0	87.6	53.7
07:36 PM - 08:36 PM	66.7	82.9	54.5

Leq Average 12 hrs. (dB(A))

64.2

Lmax (dB(A))

95.5

Standard (dB(A))

87

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดของเสียงและสั่น

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Note : LCpeak = 101.2 dB (C)

Technical Management

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P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 2490727

Date Received : Aug 16, 2024

Date Reported : Aug 21, 2024

Report Number: 3088626-1

Page 1 of 1

Sample Number 2490727-10
Parameter Noise (Leq 12 hrs.)
Location BH 1101 4th
Measurement Date Aug 15, 2024
Measurement by Ronnachai Moungma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:17 PM - 09:17 PM	86.0	87.4	85.7
09:17 PM - 10:17 PM	85.7	87.3	85.3
10:17 PM - 11:17 PM	85.4	86.9	85.1
11:17 PM - 12:17 AM	85.7	87.2	85.5
12:17 AM - 01:17 AM	86.8	88.3	86.2
01:17 AM - 02:17 AM	87.0	88.1	86.8
02:17 AM - 03:17 AM	86.9	88.4	86.3
03:17 AM - 04:17 AM	87.1	88.2	86.9
04:17 AM - 05:17 AM	87.0	88.5	86.4
05:17 AM - 06:17 AM	87.2	88.3	87.0
06:17 AM - 07:17 AM	86.8	88.3	86.2
07:17 AM - 08:17 AM	87.0	88.1	86.8

Leq Average 12 hrs. (dB(A))

86.6

Lmax (dB(A))

88.5

Standard (dB(A))

87

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดของเสียงและสั่น

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Note : LCpeak = 105.7 dB (C)

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P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 2490727

Date Received : Aug 16, 2024

Date Reported : Aug 21, 2024

Report Number: 3088628-1

Page 1 of 1

Sample Number 2490727-11
Parameter Noise (Leq 12 hrs.)
Location EM Room (1st Floor)
Measurement Date Aug 15, 2024
Measurement by Ronnchai Moungma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:31 AM - 09:31 AM	75.9	80.2	75.1
09:31 AM - 10:31 AM	75.7	81.5	74.9
10:31 AM - 11:31 AM	75.6	78.9	74.7
11:31 AM - 12:31 PM	75.5	80.3	74.6
12:31 PM - 01:31 PM	75.7	85.4	74.7
01:31 PM - 02:31 PM	75.7	80.6	74.7
02:31 PM - 03:31 PM	75.7	80.1	74.8
03:31 PM - 04:31 PM	75.8	80.7	74.7
04:31 PM - 05:31 PM	75.8	80.6	74.7
05:31 PM - 06:31 PM	75.9	80.3	75.0
06:31 PM - 07:31 PM	76.0	80.9	74.9
07:31 PM - 08:31 PM	76.0	80.8	74.9

Leq Average 12 hrs. (dB(A)) 75.8

Lmax (dB(A))

Standard (dB(A)) 87

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดของเสียงและสั่น

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Note : LCpeak = 105.7 dB (C)

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P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 2490727

Date Received : Aug 16, 2024

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Report Number: 3088628-1

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Sample Number 2490727-12
Parameter Noise (Leq 12 hrs.)
Location Utility Room (1st Floor)
Measurement Date Aug 15, 2024
Measurement by Ronnchai Moungma

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:35 AM - 09:35 AM	87.2	88.4	86.8
09:35 AM - 10:35 AM	87.0	88.6	86.5
10:35 AM - 11:35 AM	87.2	88.5	86.8
11:35 AM - 12:35 PM	86.8	89.3	86.0
12:35 PM - 01:35 PM	87.1	88.4	86.6
01:35 PM - 02:35 PM	87.2	88.4	86.7
02:35 PM - 03:35 PM	87.2	88.6	86.8
03:35 PM - 04:35 PM	87.0	88.8	86.6
04:35 PM - 05:35 PM	87.3	88.5	86.9
05:35 PM - 06:35 PM	87.0	88.4	86.6
06:35 PM - 07:35 PM	86.8	88.6	86.4
07:35 PM - 08:35 PM	87.1	88.3	86.7

Leq Average 12 hrs. (dB(A)) 87.1

Lmax (dB(A))

Standard (dB(A)) 87

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดของเสียงและสั่น

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Note : LCpeak = 106.9 dB (C)

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Analysis / Test Report

Client : BASF (Thai) Limited

111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Plauckdaeng, Amphur Plauckdaeng,
Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136542

Date Received : Dec 18, 2024

Date Reported : Dec 20, 2024

Report Number: 3198701-1

Page 1 of 1

Sample Number 24136542-1
Parameter Noise (Leq 12 hrs.)
Location Packing (1st Floor)
Measurement Date Dec 17, 2024
Measurement by Tinnakorn Kumpasee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
07:29 PM - 08:29 PM	72.4	79.3	71.6
08:29 PM - 09:29 PM	72.6	80.0	71.8
09:29 PM - 10:29 PM	72.7	78.9	71.9
10:29 PM - 11:29 PM	73.5	81.0	72.4
11:29 PM - 12:29 AM	73.4	80.1	72.2
12:29 AM - 01:29 AM	73.0	79.4	72.0
01:29 AM - 02:29 AM	73.1	79.4	72.1
02:29 AM - 03:29 AM	73.0	81.9	72.0
03:29 AM - 04:29 AM	72.6	78.5	71.9
04:29 AM - 05:29 AM	73.0	81.2	72.0
05:29 AM - 06:29 AM	73.6	83.0	72.7
06:29 AM - 07:29 AM	73.3	84.3	72.1

Leq Average 12 hrs. (dB(A)) 73.0

Lmax (dB(A))

Standard (dB(A)) 87

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดของเสียงและสั่น

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Note : LCpeak = 106.2 dB (C)

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Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136542

Date Received : Dec 18, 2024

Date Reported : Dec 20, 2024

Report Number: 3198702-1

Page 1 of 1

Sample Number 24136542-2
Parameter Noise (Leq 12 hrs.)
Location Band Dryer Area (2nd Floor)
Measurement Date Dec 17, 2024
Measurement by Tinnakorn Kumpasee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:11 PM - 09:11 PM	88.8	90.3	88.6
09:11 PM - 10:11 PM	88.8	89.6	88.6
10:11 PM - 11:11 PM	88.9	89.7	88.7
11:11 PM - 12:11 AM	88.9	89.9	88.7
12:11 AM - 01:11 AM	88.9	89.7	88.7
01:11 AM - 02:11 AM	88.9	89.8	88.7
02:11 AM - 03:11 AM	88.9	90.1	88.7
03:11 AM - 04:11 AM	88.9	89.8	88.6
04:11 AM - 05:11 AM	88.9	89.7	88.7
05:11 AM - 06:11 AM	88.9	90.0	88.7
06:11 AM - 07:11 AM	89.0	89.9	88.7
07:11 AM - 08:11 AM	89.0	89.8	88.7

Leq Average 12 hrs. (dB(A)) 88.9

Lmax (dB(A))

Standard (dB(A)) 87

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดของเสียงและสั่น

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Note : LCpeak = 114.2 dB (C)

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136542
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number: 3198703-1

Page 1 of 1

Sample Number 24136542-3
Parameter Noise (Leq 12 hrs.)
Location Polybelt Area (3rd Floor)
Measurement Date Dec 17, 2024
Measurement by Tinnakorn Kumpasee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:18 AM - 09:18 AM	81.0	84.6	80.9
09:18 AM - 10:18 AM	81.0	84.7	80.9
10:18 AM - 11:18 AM	81.1	84.7	81.0
11:18 AM - 12:18 PM	81.1	84.7	81.0
12:18 PM - 01:18 PM	81.2	84.4	81.0
01:18 PM - 02:18 PM	81.2	84.5	81.0
02:18 PM - 03:18 PM	81.3	84.5	81.1
03:18 PM - 04:18 PM	81.3	84.6	81.1
04:18 PM - 05:18 PM	81.3	84.6	81.1
05:18 PM - 06:18 PM	81.3	84.7	81.1
06:18 PM - 07:18 PM	82.4	90.3	81.1
07:18 PM - 08:18 PM	83.0	84.2	82.7

Leq Average 12 hrs. (dB(A))

81.5

Lmax (dB(A))

90.3

Standard (dB(A))

87

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดผลของเสียง

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Note : LCpeak = 106.2 dB (C)

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Project Name : Monitoring
Project Location :

Lot ID: 24136542
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number: 3198704-1

Page 1 of 1

Sample Number 24136542-4
Parameter Noise (Leq 12 hrs.)
Location Extruder 2 (2nd Floor) ชั่วถั่ว
Measurement Date Dec 17, 2024
Measurement by Tinnakorn Kumpasee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:12 PM - 09:12 PM	89.6	95.7	89.2
09:12 PM - 10:12 PM	89.6	91.4	89.2
10:12 PM - 11:12 PM	89.6	91.3	89.2
11:12 PM - 12:12 AM	89.6	91.4	89.2
12:12 AM - 01:12 AM	89.7	91.2	89.2
01:12 AM - 02:12 AM	89.7	91.6	89.3
02:12 AM - 03:12 AM	89.7	91.1	89.3
03:12 AM - 04:12 AM	89.7	91.3	89.3
04:12 AM - 05:12 AM	89.7	95.5	89.3
05:12 AM - 06:12 AM	89.7	91.8	89.3
06:12 AM - 07:12 AM	89.8	91.3	89.3
07:12 AM - 08:12 AM	89.8	95.2	89.4

Leq Average 12 hrs. (dB(A))

89.7

Lmax (dB(A))

95.7

Standard (dB(A))

87

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดผลของเสียง

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Note : LCpeak = 118.5 dB (C)

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136542
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number: 3198705-1

Page 1 of 1

Sample Number 24136542-5
Parameter Noise (Leq 12 hrs.)
Location Product Surge Tank (2nd Floor)
Measurement Date Dec 17, 2024
Measurement by Tinnakorn Kumpasee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:18 PM - 09:18 PM	83.1	84.2	82.8
09:18 PM - 10:18 PM	83.1	84.3	82.8
10:18 PM - 11:18 PM	83.1	84.1	82.8
11:18 PM - 12:18 AM	83.0	84.3	82.7
12:18 AM - 01:18 AM	83.1	84.3	82.7
01:18 AM - 02:18 AM	83.0	84.1	82.7
02:18 AM - 03:18 AM	83.0	84.3	82.7
03:18 AM - 04:18 AM	83.0	84.1	82.7
04:18 AM - 05:18 AM	83.0	84.2	82.7
05:18 AM - 06:18 AM	83.0	90.5	82.6
06:18 AM - 07:18 AM	82.9	87.1	82.6
07:18 AM - 08:18 AM	82.8	84.0	82.4

Leq Average 12 hrs. (dB(A))

83.0

Lmax (dB(A))

90.5

Standard (dB(A))

87

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดผลของเสียง

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Note : LCpeak = 110.7 dB (C)

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136542
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number: 3198706-1

Page 1 of 1

Sample Number 24136542-6
Parameter Noise (Leq 12 hrs.)
Location Sifter room (3rd Floor)
Measurement Date Dec 17, 2024
Measurement by Tinnakorn Kumpasee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:28 AM - 09:28 AM	84.3	87.7	84.1
09:28 AM - 10:28 AM	83.9	91.0	83.6
10:28 AM - 11:28 AM	83.2	90.1	83.0
11:28 AM - 12:28 PM	83.3	90.1	83.1
12:28 PM - 01:28 PM	84.4	91.1	84.2
01:28 PM - 02:28 PM	83.7	90.5	83.6
02:28 PM - 03:28 PM	83.6	90.4	83.5
03:28 PM - 04:28 PM	84.6	91.4	84.5
04:28 PM - 05:28 PM	84.1	90.8	84.0
05:28 PM - 06:28 PM	84.2	90.9	84.0
06:28 PM - 07:28 PM	84.6	91.3	84.4
07:28 PM - 08:28 PM	84.2	91.0	84.0

Leq Average 12 hrs. (dB(A))

84.0

Lmax (dB(A))

91.4

Standard (dB(A))

87

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดผลของเสียง

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Note : LCpeak = 110.5 dB (C)

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136542
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number: 3198707-1

Page 1 of 1

Sample Number 24136542-7
Parameter Noise (Leq 12 hrs.)
Location Rotex SZ 1080 (3rd Floor)
Measurement Date Dec 17, 2024
Measurement by Tinnakorn Kumpasee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:11 AM - 09:11 AM	81.8	84.2	81.3
09:11 AM - 10:11 AM	81.5	83.2	81.1
10:11 AM - 11:11 AM	81.5	84.4	80.9
11:11 AM - 12:11 PM	81.5	88.6	80.2
12:11 PM - 01:11 PM	81.8	89.7	80.9
01:11 PM - 02:11 PM	81.4	84.2	80.8
02:11 PM - 03:11 PM	81.3	84.2	80.8
03:11 PM - 04:11 PM	81.3	84.4	80.7
04:11 PM - 05:11 PM	81.6	84.6	81.0
05:11 PM - 06:11 PM	81.7	84.0	80.9
06:11 PM - 07:11 PM	83.7	89.9	81.5
07:11 PM - 08:11 PM	88.8	89.9	86.6

Leq Average 12 hrs. (dB(A))

83.0

Lmax (dB(A))

89.9

Standard (dB(A))

87

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดผลของเสียง
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Note : LCpeak = 123.2 dB (C)

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136542
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number: 3198708-1

Page 1 of 1

Sample Number 24136542-8
Parameter Noise (Leq 12 hrs.)
Location K Tron PC1060 (3rd Floor)
Measurement Date Dec 17, 2024
Measurement by Tinnakorn Kumpasee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:17 AM - 09:17 AM	83.4	95.8	80.6
09:17 AM - 10:17 AM	83.2	95.8	80.5
10:17 AM - 11:17 AM	83.1	95.7	80.4
11:17 AM - 12:17 PM	82.9	95.8	80.2
12:17 PM - 01:17 PM	82.8	95.6	79.9
01:17 PM - 02:17 PM	82.8	95.6	79.8
02:17 PM - 03:17 PM	82.6	95.6	79.7
03:17 PM - 04:17 PM	82.6	95.6	79.8
04:17 PM - 05:17 PM	82.8	95.8	80.0
05:17 PM - 06:17 PM	82.3	95.7	79.7
06:17 PM - 07:17 PM	82.6	95.8	75.7
07:17 PM - 08:17 PM	82.4	83.6	82.0

Leq Average 12 hrs. (dB(A))

82.8

Lmax (dB(A))

95.8

Standard (dB(A))

87

140

Reference Method : ISO1996-1 and 1996-2

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Note : LCpeak = 112.1 dB (C)

Technical Management

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136542
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number: 3198709-1

Page 1 of 1

Sample Number 24136542-9
Parameter Noise (Leq 12 hrs.)
Location Control Room (1st Floor)
Measurement Date Dec 17, 2024
Measurement by Tinnakorn Kumpasee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:29 AM - 09:29 AM	63.9	82.0	54.6
09:29 AM - 10:29 AM	63.8	81.4	52.8
10:29 AM - 11:29 AM	63.6	82.3	51.4
11:29 AM - 12:29 PM	65.7	79.7	56.4
12:29 PM - 01:29 PM	62.4	79.0	55.0
01:29 PM - 02:29 PM	65.7	91.7	56.3
02:29 PM - 03:29 PM	65.9	88.5	54.6
03:29 PM - 04:29 PM	66.7	82.9	54.5
04:29 PM - 05:29 PM	64.8	82.9	55.5
05:29 PM - 06:29 PM	67.0	96.3	56.3
06:29 PM - 07:29 PM	68.3	90.9	57.0
07:29 PM - 08:29 PM	68.0	84.2	55.8

Leq Average 12 hrs. (dB(A))

65.8

Lmax (dB(A))

98.3

Standard (dB(A))

87

140

Reference Method : ISO1996-1 and 1996-2

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Note : LCpeak = 101.2 dB (C)

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Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136542
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number: 3198710-1

Page 1 of 1

Sample Number 24136542-10
Parameter Noise (Leq 12 hrs.)
Location BH 1101 4th
Measurement Date Dec 17, 2024
Measurement by Tinnakorn Kumpasee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:12 AM - 09:12 AM	88.3	90.3	87.8
09:12 AM - 10:12 AM	87.8	89.5	87.2
10:12 AM - 11:12 AM	87.7	89.1	87.3
11:12 AM - 12:12 PM	87.2	88.5	86.4
12:12 PM - 01:12 PM	86.8	87.8	86.4
01:12 PM - 02:12 PM	86.5	87.8	86.2
02:12 PM - 03:12 PM	86.3	87.5	86.0
03:12 PM - 04:12 PM	86.2	87.1	85.9
04:12 PM - 05:12 PM	86.2	87.2	86.0
05:12 PM - 06:12 PM	86.4	87.4	86.2
06:12 PM - 07:12 PM	86.7	91.5	86.2
07:12 PM - 08:12 PM	89.5	91.1	89.1

Leq Average 12 hrs. (dB(A))

87.3

Lmax (dB(A))

91.5

Standard (dB(A))

87

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดผลของเสียง
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Note : LCpeak = 113.4 dB (C)

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

Supot S
Supot Salamteah
Section Head

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Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136542
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number: 3196711-1

Page 1 of 1

Sample Number 24136542-11
Parameter Noise (Leq 12 hrs.)
Location EM Room (1st Floor)
Measurement Date Dec 17, 2024
Measurement by Tinnakorn Kumpassee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:17 PM - 09:17 PM	75.5	82.4	74.7
09:17 PM - 10:17 PM	75.7	83.1	74.9
10:17 PM - 11:17 PM	75.8	82.0	75.0
11:17 PM - 12:17 AM	76.6	84.1	75.5
12:17 AM - 01:17 AM	76.5	83.2	75.3
01:17 AM - 02:17 AM	76.1	82.5	75.1
02:17 AM - 03:17 AM	76.2	82.5	75.2
03:17 AM - 04:17 AM	76.1	85.0	75.1
04:17 AM - 05:17 AM	75.7	81.6	75.0
05:17 AM - 06:17 AM	76.1	84.3	75.1
06:17 AM - 07:17 AM	76.7	86.1	75.8
07:17 AM - 08:17 AM	76.4	87.4	75.2

Leq Average 12 hrs. (dB(A))

76.1

Lmax (dB(A))

87.4

Standard (dB(A))

87

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดความดังเสียง

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Note : LCpeak = 110.6 dB (C)

Technical Management

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Chonticha Subongkoch
Scientist (3)

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Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136542
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number: 3196712-1

Page 1 of 1

Sample Number 24136542-12
Parameter Noise (Leq 12 hrs.)
Location Utility Room (1st Floor)
Measurement Date Dec 17, 2024
Measurement by Tinnakorn Kumpassee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:27 PM - 09:27 PM	87.7	91.9	86.4
09:27 PM - 10:27 PM	88.1	89.1	87.8
10:27 PM - 11:27 PM	88.9	92.2	88.1
11:27 PM - 12:27 AM	88.9	93.0	88.3
12:27 AM - 01:27 AM	89.1	93.6	87.8
01:27 AM - 02:27 AM	86.7	92.4	85.2
02:27 AM - 03:27 AM	85.4	86.9	85.1
03:27 AM - 04:27 AM	83.6	86.7	81.0
04:27 AM - 05:27 AM	85.3	88.6	81.2
05:27 AM - 06:27 AM	87.4	91.9	85.9
06:27 AM - 07:27 AM	88.7	91.9	87.3
07:27 AM - 08:27 AM	88.6	91.9	87.8

Leq Average 12 hrs. (dB(A))

87.7

Lmax (dB(A))

93.6

Standard (dB(A))

87

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการวัดความดังเสียง

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Note : LCpeak = 111.2 dB (C)

Technical Management

Chontichak
Chonticha Subongkoch
Scientist (3)

Approved by

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Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490728
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number: 3089256-1

Page 1 of 1

Sample Number 2490728-1
Parameter Octave band
Location Packing (1st Floor)
Measurement Date Aug 15, 2024
Measurement By Ronnachai Moungma

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:29 AM - 09:29 AM	73.2	23.6	39.6	46.1	55.0	57.8	63.9	65.4	67.5	66.1	58.9	64.9
09:29 AM - 10:29 AM	70.5	26.6	41.0	48.5	56.1	57.2	62.5	63.7	64.2	63.7	57.1	56.7
10:29 AM - 11:29 AM	66.1	23.2	39.1	45.1	54.5	55.6	59.2	60.1	58.4	57.8	52.7	43.6
11:29 AM - 12:29 PM	78.5	21.2	39.4	44.0	54.0	57.3	64.1	68.8	71.8	73.0	72.6	67.7
12:29 PM - 01:29 PM	69.3	22.5	39.6	44.0	55.6	55.7	60.4	63.8	63.3	61.5	57.6	50.1
01:29 PM - 02:29 PM	69.8	26.0	40.8	48.0	54.1	56.4	60.8	62.2	62.4	64.4	61.0	52.8
02:29 PM - 03:29 PM	67.8	25.1	40.4	47.2	53.4	56.1	59.7	60.4	60.2	62.2	56.9	47.7
03:29 PM - 04:29 PM	70.4	26.6	41.1	48.4	54.4	56.8	62.3	63.2	62.6	64.8	61.1	52.7
04:29 PM - 05:29 PM	70.4	27.3	41.2	47.9	54.8	57.0	62.1	63.9	63.1	64.6	60.1	51.6
05:29 PM - 06:29 PM	67.2	24.3	40.2	46.2	55.6	56.7	60.3	61.2	59.5	58.9	53.8	44.7
06:29 PM - 07:29 PM	70.6	26.8	41.3	48.6	54.6	57.0	62.5	63.4	62.8	65.0	61.3	52.9
07:29 PM - 08:29 PM	70.6	27.5	41.4	48.1	55.0	57.2	62.3	64.1	63.3	64.8	60.3	51.8
Average	71.8	25.5	40.5	47.1	54.8	56.8	61.9	64.0	65.0	65.8	63.5	59.4

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyoung
Scientist (3)

Approved by

Supot S
Supot Salamteh
Section Head

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Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490728
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number: 3089257-1

Page 1 of 1

Sample Number 2490728-2
Parameter Octave band
Location Band Dryer Area (2nd Floor)
Measurement Date Aug 15, 2024
Measurement By Ronnachai Moungma

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:30 AM - 09:30 AM	89.1	40.0	52.5	66.5	78.2	85.9	82.0	81.2	77.3	71.1	63.9	44.0
09:30 AM - 10:30 AM	90.1	41.0	53.7	67.5	79.1	86.8	83.0	82.2	78.2	72.0	66.2	45.5
10:30 AM - 11:30 AM	89.8	41.1	53.4	67.3	78.8	86.5	82.8	81.9	78.1	71.9	65.2	45.1
11:30 AM - 12:30 PM	89.7	40.7	53.2	67.3	78.7	86.4	82.6	81.9	78.0	71.9	64.8	45.0
12:30 PM - 01:30 PM	89.7	40.8	53.2	67.3	78.7	86.4	82.6	81.9	78.0	71.9	64.9	44.9
01:30 PM - 02:30 PM	89.8	40.8	53.3	67.3	78.8	86.5	82.7	82.0	78.1	71.9	64.9	45.0
02:30 PM - 03:30 PM	89.9	40.3	53.3	67.3	78.9	86.6	82.8	82.0	78.1	71.9	66.4	45.5
03:30 PM - 04:30 PM	89.9	40.2	53.1	67.2	78.9	86.6	82.8	81.9	78.0	71.8	64.9	44.9
04:30 PM - 05:30 PM	89.9	40.8	53.3	67.3	79.0	86.7	82.8	82.0	78.1	71.9	64.7	44.8
05:30 PM - 06:30 PM	90.0	41.0	53.4	67.3	79.1	86.7	82.9	82.1	78.1	71.9	65.0	45.0
06:30 PM - 07:30 PM	89.5	40.4	52.9	66.9	78.6	86.3	82.4	81.6	77.7	71.5	64.3	44.4
07:30 PM - 08:30 PM	89.6	40.6	53.0	66.9	78.7	86.3	82.5	81.7	77.7	71.5	64.6	44.6
Average	89.8	40.7	53.2	67.2	78.8	86.5	82.7	81.9	78.0	71.8	65.0	44.9

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyoung
Scientist (3)

Approved by

Supot S
Supot Salamteh
Section Head

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Lot ID: 2490728
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number : 3089258-1

Sample Number	2490728-3
Parameter	Octave band
Location	Polybelt Area (3rd Floor)
Measurement Date	Aug 15, 2024
Measurement By	Ronnachai Mounigma

Reference Method : ANSI Standard S1.6-1984

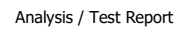
Supot Salamteh
Section Head

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Lot ID: 2490728
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number : 3089259-1

Sample Number	2490728-4
Parameter	Octave band
Location	Extruder 2 (2nd Floor) ฐาน
Measurement Date	Aug 15, 2024
Measurement By	Ronnachai Moungma

Reference Method : ANSI Standard S1.6-1984

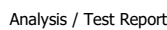
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Lot ID: 2490728
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number : 3089260-1

Sample Number	2490728-5
Parameter	Octave band
Location	Product Surge Tank (2nd Floor)
Measurement Date	Aug 15, 2024
Measurement By	Ronnachai Moungma

Reference Method : ANSI Standard S1.6-1984

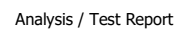
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Section Head

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Lot ID: 2490728
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number : 3089261-1

Sample Number	2490728-6
Parameter	Octave band
Location	Sifter room (3rd Floor)
Measurement Date	Aug 15, 2024
Measurement By	Ronnachai Mungma

Reference Method : ANSI Standard S1.6-1984

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Supot Salamteh
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Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490728
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number : 3089262-1

Page 1 of 1

Sample Number	2490728-7																
Parameter	Octave band																
Location	Rotex SZ 1080 (3rd Floor)																
Measurement Date	Aug 15, 2024																
Measurement By	Ronnachai Moungma																
Time						Result (dB(A))											
Leq						16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz	
08:59 PM - 09:59 PM						83.2	26.7	41.9	54.5	68.7	72.8	74.8	78.0	76.1	75.8	70.0	54.5
09:59 PM - 10:59 PM						83.0	27.3	41.7	54.4	68.7	72.6	74.6	77.9	75.8	75.4	69.9	54.4
10:59 PM - 11:59 PM						83.1	26.6	42.7	54.6	68.8	73.0	74.8	78.0	75.9	75.4	69.8	54.2
11:59 PM - 12:59 AM						83.1	27.0	42.2	54.4	68.6	73.0	74.8	77.9	75.8	75.5	69.8	54.4
12:59 AM - 01:59 AM						83.2	27.0	41.9	54.4	68.9	73.0	74.9	78.3	76.0	75.2	69.6	54.0
01:59 AM - 02:59 AM						83.4	25.6	42.1	54.7	69.1	73.3	75.0	78.6	76.0	75.2	69.8	54.0
02:59 AM - 03:59 AM						83.3	27.6	42.0	54.7	69.0	72.9	74.9	78.2	76.1	75.7	70.2	54.7
03:59 AM - 04:59 AM						83.4	26.9	43.0	54.9	69.1	73.3	75.1	78.3	76.2	75.7	70.1	54.5
04:59 AM - 05:59 AM						83.4	27.3	42.5	54.7	68.9	73.3	75.1	78.2	76.1	75.8	70.1	54.7
05:59 AM - 06:59 AM						83.5	27.3	42.2	54.7	69.2	73.3	75.2	78.6	76.3	75.5	69.9	54.3
06:59 AM - 07:59 AM						83.7	25.9	42.4	55.0	69.4	73.6	75.3	78.9	76.3	75.5	70.1	54.3
07:59 AM - 08:59 AM						83.6	27.9	42.3	55.0	69.3	73.2	75.2	78.5	76.4	76.0	70.5	55.0
Average						83.3	27.0	42.3	54.7	69.0	73.1	75.0	78.3	76.1	75.6	70.0	54.4

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakying
Scientist (3)

Approved by

Supot S
Supot Salamteh
Section Head

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Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490728
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number : 3089263-1

Page 1 of 1

Sample Number	2490728-8														
Parameter	Octave band														
Location	K Tron PC1060 (3rd Floor)														
Measurement Date	Aug 15, 2024														
Measurement By	Ronnachai Moungma														
Time	Result (dB(A))														
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz			
08:19 PM - 09:19 PM	83.3	26.8	42.0	54.6	68.8	72.9	74.9	78.1	76.2	75.9	70.1	54.6			
09:19 PM - 10:19 PM	83.3	27.6	42.0	54.7	69.0	72.9	74.9	78.2	76.1	75.7	70.2	54.7			
10:19 PM - 11:19 PM	83.3	26.8	42.9	54.8	69.0	73.2	75.0	78.2	76.1	75.6	70.0	54.4			
11:19 PM - 12:19 AM	83.3	27.2	42.4	54.6	68.8	73.2	75.0	78.1	76.0	75.7	70.0	54.6			
12:19 AM - 01:19 AM	83.4	27.2	42.1	54.6	69.1	73.2	75.1	78.5	76.2	75.4	69.8	54.2			
01:19 AM - 02:19 AM	83.3	25.5	42.0	54.6	69.0	73.2	74.9	78.5	75.9	75.1	69.7	53.9			
02:19 AM - 03:19 AM	83.2	27.5	41.9	54.6	68.9	72.8	74.8	78.1	76.0	75.6	70.1	54.6			
03:19 AM - 04:19 AM	83.3	26.8	42.9	54.8	69.0	73.2	75.0	78.2	76.1	75.6	70.0	54.4			
04:19 AM - 05:19 AM	83.3	27.2	42.4	54.6	68.8	73.2	75.0	78.1	76.0	75.7	70.0	54.6			
05:19 AM - 06:19 AM	83.4	27.2	42.1	54.6	69.1	73.2	75.1	78.5	76.2	75.4	69.8	54.2			
06:19 AM - 07:19 AM	83.6	25.8	42.3	54.9	69.3	73.5	75.2	78.8	76.2	75.4	70.0	54.2			
07:19 AM - 08:19 AM	83.5	27.8	42.2	54.9	69.2	73.1	75.1	78.4	76.3	75.9	70.4	54.9			
Average	83.4	27.0	42.3	54.7	69.0	73.1	75.0	78.3	76.1	75.6	70.0	54.5			

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakying
Scientist (3)

Approved by

Supot S
Supot Salamteh
Section Head

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S\Reports_Air Noise_Octave band rpt (6:13PM)



Analysis / Test Report

Client : BASF (Thai) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Puakdaeng,
Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490728
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number : 3089266-1

Page 1 of 1

Sample Number 2490728-11
Parameter Octave band
Location EM Room (1st Floor)
Measurement Date Aug 15, 2024
Measurement By Ronnachai Moungma

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:31 AM - 09:31 AM	75.9	22.0	40.3	53.1	61.3	65.6	65.7	68.3	68.8	70.1	67.0	54.6
09:31 AM - 10:31 AM	75.7	21.7	39.8	52.9	61.2	65.2	65.5	67.8	68.5	70.1	67.2	54.7
10:31 AM - 11:31 AM	75.6	23.7	39.2	52.7	61.3	64.8	65.3	67.6	68.4	70.0	67.3	54.7
11:31 AM - 12:31 PM	75.5	23.6	39.2	52.5	61.3	64.5	65.4	67.5	68.3	69.9	67.1	54.5
12:31 PM - 01:31 PM	75.7	23.7	40.3	52.8	61.4	65.0	65.8	67.9	68.7	70.0	67.0	54.5
01:31 PM - 02:31 PM	75.7	23.8	40.3	52.9	61.5	65.1	65.8	67.8	68.5	70.0	67.1	54.6
02:31 PM - 03:31 PM	75.7	23.9	40.1	52.9	61.5	65.0	65.8	67.9	68.5	70.0	67.2	54.6
03:31 PM - 04:31 PM	75.8	24.0	40.4	53.1	61.7	64.8	65.8	67.8	68.6	70.1	67.4	54.8
04:31 PM - 05:31 PM	75.8	23.5	40.2	53.0	61.6	64.9	65.6	67.9	68.5	70.1	67.3	54.7
05:31 PM - 06:31 PM	75.9	24.1	40.3	53.1	61.7	65.2	66.0	68.1	68.7	70.2	67.4	54.8
06:31 PM - 07:31 PM	76.0	24.2	40.6	53.3	61.9	65.0	66.0	68.0	68.8	70.3	67.6	55.0
07:31 PM - 08:31 PM	76.0	23.7	40.4	53.2	61.8	65.1	65.8	68.1	68.7	70.3	67.5	54.9
Average	75.8	23.6	40.1	53.0	61.5	65.0	65.7	67.9	68.6	70.1	67.3	54.7

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyoung
Scientist (3)

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Supot Salamteh
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Analysis / Test Report

Client : BASF (Thai) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Puakdaeng,
Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490728
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number : 3089267-1

Page 1 of 1

Sample Number 2490728-12
Parameter Octave band
Location Utility Room (1st Floor)
Measurement Date Aug 15, 2024
Measurement By Ronnachai Moungma

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:35 AM - 09:35 AM	87.2	35.3	43.7	58.1	64.3	71.2	75.6	79.5	79.9	83.7	76.7	57.3
09:35 AM - 10:35 AM	87.0	35.0	43.6	59.0	64.5	71.1	74.8	79.9	80.0	83.3	76.3	57.1
10:35 AM - 11:35 AM	87.2	34.7	43.3	59.0	64.9	71.2	74.0	80.7	80.3	83.4	76.4	57.0
11:35 AM - 12:35 PM	86.8	34.6	43.1	58.9	64.6	70.7	73.4	80.7	79.4	83.1	76.2	56.7
12:35 PM - 01:35 PM	87.1	34.8	43.5	59.0	64.7	70.9	74.1	80.2	79.7	83.7	76.6	57.2
01:35 PM - 02:35 PM	87.2	35.1	43.6	59.2	64.9	71.3	74.4	80.4	80.3	83.4	76.3	57.3
02:35 PM - 03:35 PM	87.2	34.7	43.4	59.2	64.5	71.1	74.0	80.8	80.1	83.5	76.5	57.2
03:35 PM - 04:35 PM	87.0	34.9	43.6	59.2	64.8	70.9	74.8	79.7	80.1	83.4	76.4	57.3
04:35 PM - 05:35 PM	87.3	34.8	43.6	59.0	64.8	71.2	74.5	80.5	80.4	83.5	76.5	57.3
05:35 PM - 06:35 PM	87.0	34.5	43.2	59.0	64.3	70.9	73.8	80.6	79.9	83.3	76.3	57.0
06:35 PM - 07:35 PM	86.8	34.7	43.4	59.0	64.6	70.7	74.6	79.5	79.9	83.2	76.2	57.1
07:35 PM - 08:35 PM	87.1	34.6	43.4	58.8	64.6	71.0	74.3	80.3	80.2	83.3	76.3	57.1
Average	87.1	34.8	43.5	59.0	64.6	71.0	74.4	80.3	80.0	83.4	76.4	57.1

Reference Method : ANSI Standard S1.6-1984

Technical Management

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Orawan Rakyoung
Scientist (3)

Approved by

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Supot Salamteh
Section Head

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Analysis / Test Report

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Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136544
Date Received : Dec 18, 2024
Date Reported : Dec 24, 2024
Report Number : 3200979-1

Page 1 of 1

Sample Number 24136544-1
Parameter Octave band
Location Packing (1st Floor)
Measurement Date Dec 17, 2024
Measurement By Tinnakorn Kumpasee

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
07:29 PM - 08:29 PM	72.4	22.8	36.0	50.0	59.4	64.2	64.0	65.1	65.9	65.4	57.6	42.2
08:29 PM - 09:29 PM	72.6	22.7	36.2	50.6	60.0	64.7	64.4	65.3	66.0	65.4	57.7	42.4
09:29 PM - 10:29 PM	72.7	22.6	36.3	50.6	60.1	64.8	64.3	65.5	66.1	65.6	57.8	42.5
10:29 PM - 11:29 PM	73.5	22.6	36.5	51.1	60.8	65.4	65.5	66.6	66.8	65.8	58.1	43.1
11:29 PM - 12:29 AM	73.4	22.4	36.5	51.3	60.9	65.5	65.2	66.3	67.0	65.9	58.1	42.9
12:29 AM - 01:29 AM	73.0	22.4	36.5	51.0	60.6	65.2	64.7	65.8	66.3	65.7	57.9	42.5
01:29 AM - 02:29 AM	73.1	22.3	36.6	51.1	60.6	65.4	64.8	65.9	66.4	65.8	57.9	42.5
02:29 AM - 03:29 AM	73.0	22.4	36.4	50.8	60.2	65.2	64.6	65.8	66.3	65.8	57.9	42.5
03:29 AM - 04:29 AM	72.6	22.8	35.9	50.2	59.6	64.6	64.0	65.5	66.1	65.6	57.8	42.5
04:29 AM - 05:29 AM	73.0	22.9	36.3	50.8	60.2	65.2	64.4	66.0	66.4	65.8	57.9	42.5
05:29 AM - 06:29 AM	73.6	22.7	36.4	50.9	60.6	65.5	65.0	67.0	67.1	66.0	58.2	43.1
06:29 AM - 07:29 AM	73.3	22.7	36.4	50.8	60.3	65.2	64.6	66.1	67.4	66.0	58.3	42.9
Average	73.0	22.6	36.3	50.8	60.3	65.1	64.6	65.9	66.5	65.7	57.9	42.6

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyoung
Scientist (3)

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Supot S.
Supot Salamteh
Section Head

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Analysis / Test Report

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Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136544
Date Received : Dec 18, 2024
Date Reported : Dec 24, 2024
Report Number : 3200980-1

Page 1 of 1

Sample Number 24136544-2
Parameter Octave band
Location Band Dryer Area (2nd Floor)
Measurement Date Dec 17, 2024
Measurement By Tinnakorn Kumpasee

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:11 PM - 09:11 PM	88.8	40.8	53.4	68.3	76.5	85.1	82.4	81.3	77.9	71.3	60.7	43.6
09:11 PM - 10:11 PM	88.8	40.8	53.5	68.2	76.6	85.1	82.3	81.3	77.9	71.1	60.8	43.8
10:11 PM - 11:11 PM	88.9	40.8	53.6	68.3	76.6	85.2	82.5	81.4	77.9	71.1	60.7	43.9
11:11 PM - 12:11 AM	88.9	40.7	53.6	68.3	76.8	85.2	82.5	81.4	77.9	71.1	61.0	44.0
12:11 AM - 01:11 AM	88.9	40.5	53.7	68.4	76.9	85.2	82.5	81.4	77.9	71.1	60.7	44.1
01:11 AM - 02:11 AM	88.9	40.9	53.7	68.4	76.9	85.2	82.4	81.4	77.9	71.1	60.6	43.9
02:11 AM - 03:11 AM	88.9	40.6	53.5	68.4	76.9	85.2	82.4	81.4	77.9	71.1	61.1	43.8
03:11 AM - 04:11 AM	88.9	40.5	53.5	68.4	77.0	85.2	82.4	81.4	77.9	71.0	60.6	43.8
04:11 AM - 05:11 AM	88.9	41.1	53.6	68.4	77.0	85.2	82.4	81.4	77.9	71.1	60.5	43.8
05:11 AM - 06:11 AM	88.9	40.8	53.6	68.4	76.9	85.3	82.4	81.4	78.0	71.1	60.5	43.8
06:11 AM - 07:11 AM	89.0	40.8	53.7	68.5	76.9	85.3	82.5	81.5	78.0	71.1	60.6	44.1
07:11 AM - 08:11 AM	89.0	40.3	53.8	68.5	76.8	85.4	82.5	81.4	78.0	71.1	60.5	43.8
Average	88.9	40.7	53.6	68.4	76.8	85.2	82.4	81.4	77.9	71.1	60.7	43.9

Reference Method : ANSI Standard S1.6-1984

Technical Management

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Supot Salamteh
Section Head

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Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136544
Date Received : Dec 18, 2024
Date Reported : Dec 24, 2024
Report Number : 3200981-1

Page 1 of 1

Sample Number 24136544-3
Parameter Octave band
Location Polybelt Area (3rd Floor)
Measurement Date Dec 17, 2024
Measurement By Tinnakorn Kumpasee

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:18 AM - 09:18 AM	81.0	29.0	46.4	56.8	66.4	73.7	73.9	74.6	74.2	71.8	64.7	47.1
09:18 AM - 10:18 AM	81.0	28.9	46.5	57.1	66.2	73.8	73.9	74.8	74.1	71.6	64.6	46.7
10:18 AM - 11:18 AM	81.1	29.3	46.3	57.4	66.2	73.8	74.3	74.9	74.2	71.6	64.4	46.5
11:18 AM - 12:18 PM	81.1	29.6	46.6	57.5	66.0	73.9	74.6	74.7	74.2	71.6	64.4	46.5
12:18 PM - 01:18 PM	81.2	29.4	46.5	57.7	65.9	73.9	75.0	74.4	74.1	71.5	64.3	46.4
01:18 PM - 02:18 PM	81.2	29.2	46.9	57.6	65.9	74.1	75.1	74.3	74.1	71.5	64.3	46.4
02:18 PM - 03:18 PM	81.3	29.6	46.7	57.5	65.9	74.2	75.3	74.3	74.2	71.5	64.3	46.4
03:18 PM - 04:18 PM	81.3	29.8	47.1	57.5	65.9	74.1	75.3	74.3	74.2	71.5	64.4	46.5
04:18 PM - 05:18 PM	81.3	29.9	46.9	57.2	66.0	74.0	75.2	74.5	74.2	71.6	64.4	46.6
05:18 PM - 06:18 PM	81.3	30.0	47.3	57.2	66.3	74.0	74.8	74.9	74.2	71.6	64.6	46.9
06:18 PM - 07:18 PM	82.4	32.3	48.3	58.4	69.0	76.2	75.8	75.8	74.5	72.0	65.0	51.2
07:18 PM - 08:18 PM	83.0	31.4	49.2	59.4	67.7	77.6	77.1	76.0	73.8	72.1	65.8	52.0
Average	81.5	30.0	47.1	57.7	66.6	74.6	75.1	74.8	74.2	71.7	64.6	47.9

Reference Method : ANSI Standard S1.6-1984

Technical Management

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Supot Salamteah
Section Head

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Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136544
Date Received : Dec 18, 2024
Date Reported : Dec 24, 2024
Report Number : 3200982-1

Page 1 of 1

Sample Number 24136544-4
Parameter Octave band
Location Extruder 2 (2nd Floor) ฐาน
Measurement Date Dec 17, 2024
Measurement By Tinnakorn Kumpasee

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:12 PM - 09:12 PM	89.6	34.1	48.8	61.4	79.9	87.1	82.4	78.4	75.0	72.6	63.1	47.1
09:12 PM - 10:12 PM	89.6	34.0	48.8	61.6	80.0	87.1	82.4	78.4	74.6	71.8	60.9	47.4
10:12 PM - 11:12 PM	89.6	34.1	49.0	61.7	80.0	87.2	82.4	78.3	74.6	72.2	62.1	47.9
11:12 PM - 12:12 AM	89.6	34.0	48.9	61.7	80.0	87.2	82.5	78.2	74.8	72.0	61.2	46.6
12:12 AM - 01:12 AM	89.7	34.1	48.9	61.8	80.2	87.3	82.6	78.1	74.9	71.9	62.0	46.2
01:12 AM - 02:12 AM	89.7	34.1	49.1	61.8	80.2	87.3	82.5	78.1	75.0	71.9	61.5	46.5
02:12 AM - 03:12 AM	89.7	34.4	48.9	61.8	80.3	87.3	82.6	77.9	74.9	72.3	61.7	47.8
03:12 AM - 04:12 AM	89.7	33.8	48.8	61.8	80.3	87.3	82.5	77.9	75.1	72.7	62.6	47.6
04:12 AM - 05:12 AM	89.7	34.0	48.9	61.8	80.4	87.2	82.6	77.9	75.2	72.6	62.8	47.2
05:12 AM - 06:12 AM	89.7	34.0	48.9	61.8	80.3	87.3	82.5	77.9	75.2	72.9	63.5	46.7
06:12 AM - 07:12 AM	89.8	34.1	49.0	61.7	80.4	87.4	82.6	77.9	75.0	72.4	62.5	46.5
07:12 AM - 08:12 AM	89.8	33.8	48.9	61.6	80.5	87.3	82.6	78.0	75.3	73.1	64.0	47.3
Average	89.7	34.0	48.9	61.7	80.2	87.3	82.5	78.1	75.0	72.4	62.4	47.1

Reference Method : ANSI Standard S1.6-1984

Technical Management

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Scientist (3)

Approved by

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Supot Salamteah
Section Head

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Analysis / Test Report

Client : BASF (Thai) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Puakdaeng,
Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136544
Date Received : Dec 18, 2024
Date Reported : Dec 24, 2024
Report Number : 3200983-1

Page 1 of 1

Sample Number 24136544-5
Parameter Octave band
Location Product Surge Tank (2nd Floor)
Measurement Date Dec 17, 2024
Measurement By Tinnakorn Kumpasee

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:18 PM - 09:18 PM	83.1	31.3	49.3	59.5	67.7	77.7	77.3	76.0	73.7	72.3	65.7	51.8
09:18 PM - 10:18 PM	83.1	31.3	49.3	59.4	67.7	77.7	77.3	76.0	73.7	72.5	65.9	52.0
10:18 PM - 11:18 PM	83.1	31.3	49.4	59.5	67.8	77.7	77.4	75.9	73.6	72.2	65.8	52.1
11:18 PM - 12:18 AM	83.0	31.5	49.3	59.4	67.8	77.8	77.3	75.8	73.5	72.0	65.9	52.2
12:18 AM - 01:18 AM	83.1	31.0	49.3	59.7	67.8	77.8	77.3	75.9	73.5	72.0	65.9	52.1
01:18 AM - 02:18 AM	83.0	31.1	49.3	59.7	67.8	77.8	77.3	75.8	73.4	71.7	65.8	51.9
02:18 AM - 03:18 AM	83.0	30.8	49.2	59.7	67.8	77.9	77.3	75.8	73.4	71.7	65.7	51.9
03:18 AM - 04:18 AM	83.0	31.3	49.2	59.7	67.9	77.8	77.4	75.7	73.3	71.5	65.7	51.9
04:18 AM - 05:18 AM	83.0	31.2	49.3	59.7	67.8	77.7	77.7	75.7	73.3	71.4	65.8	51.9
05:18 AM - 06:18 AM	83.0	31.1	49.3	59.7	67.8	77.8	77.6	75.6	73.1	71.4	65.9	52.0
06:18 AM - 07:18 AM	82.9	30.9	49.3	59.7	67.9	77.8	77.5	75.4	72.9	71.4	65.9	52.3
07:18 AM - 08:18 AM	82.8	31.1	49.4	59.5	67.9	77.7	77.2	75.3	72.9	71.3	65.8	52.0
Average	83.0	31.2	49.3	59.6	67.8	77.8	77.4	75.7	73.4	71.8	65.8	52.0

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyoung
Scientist (3)

Approved by

Supot S.
Supot Salamteah
Section Head

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S:\Reports_Air Noise_Octave band rpt (10-42AM)



Analysis / Test Report

Client : BASF (Thai) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Puakdaeng,
Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136544
Date Received : Dec 18, 2024
Date Reported : Dec 24, 2024
Report Number : 3200984-1

Page 1 of 1

Sample Number 24136544-6
Parameter Octave band
Location Sifter room (3rd Floor)
Measurement Date Dec 17, 2024
Measurement By Tinnakorn Kumpasee

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:28 AM - 09:28 AM	84.3	35.2	49.2	60.1	68.0	74.3	77.6	78.3	77.9	75.4	70.4	58.4
09:28 AM - 10:28 AM	83.9	33.9	48.0	59.7	71.2	74.8	76.8	77.9	77.3	74.7	70.0	58.1
10:28 AM - 11:28 AM	83.2	33.0	46.9	58.7	71.7	74.8	75.9	76.8	76.2	73.9	69.3	57.4
11:28 AM - 12:28 PM	83.3	32.9	47.0	58.7	71.8	75.0	76.0	76.9	76.3	74.0	69.4	57.5
12:28 PM - 01:28 PM	84.4	34.0	48.1	59.8	73.0	76.1	77.1	78.0	77.4	75.0	70.3	58.4
01:28 PM - 02:28 PM	83.7	33.3	47.4	59.2	72.4	75.5	76.4	77.3	76.7	74.3	69.8	57.9
02:28 PM - 03:28 PM	83.6	33.4	47.3	59.1	72.3	75.4	76.3	77.2	76.7	74.2	69.5	57.6
03:28 PM - 04:28 PM	84.6	34.4	48.4	60.1	73.3	76.4	77.4	78.2	77.7	75.3	70.6	58.8
04:28 PM - 05:28 PM	84.1	34.0	47.7	59.6	72.8	75.9	76.9	77.7	77.2	74.7	70.0	58.1
05:28 PM - 06:28 PM	84.2	33.9	47.6	59.8	73.0	75.9	76.9	77.8	77.2	74.7	70.1	58.3
06:28 PM - 07:28 PM	84.6	33.9	48.1	60.3	73.4	76.3	77.3	78.2	77.5	75.1	70.5	58.6
07:28 PM - 08:28 PM	84.2	33.8	47.9	59.7	72.8	75.9	76.9	77.8	77.1	74.8	70.1	58.1
Average	84.0	33.9	47.8	59.6	72.3	75.6	76.8	77.7	77.1	74.7	70.0	58.1

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyoung
Scientist (3)

Approved by

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Supot Salamteah
Section Head

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S:\Reports_Air Noise_Octave band rpt (10-42AM)



Analysis / Test Report

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Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136544
Date Received : Dec 18, 2024
Date Reported : Dec 24, 2024
Report Number : 3200985-1

Page 1 of 1

Sample Number 24136544-7
Parameter Octave band
Location Rotex SZ 1080 (3rd Floor)
Measurement Date Dec 17, 2024
Measurement By Tinnakorn Kumpasee

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:11 AM - 09:11 AM	81.8	26.2	41.9	57.2	68.5	73.4	75.0	76.0	74.6	72.5	66.1	52.9
09:11 AM - 10:11 AM	81.5	25.8	41.6	56.8	68.1	72.9	74.5	75.6	74.5	72.5	66.1	52.8
10:11 AM - 11:11 AM	81.5	25.7	41.5	56.7	68.0	72.8	74.6	75.5	74.5	72.5	66.1	52.8
11:11 AM - 12:11 PM	81.5	25.2	41.1	56.1	67.7	72.4	74.3	75.3	74.7	73.4	67.2	54.7
12:11 PM - 01:11 PM	81.8	25.9	42.0	56.4	68.1	72.5	74.6	75.8	74.8	73.6	67.3	54.9
01:11 PM - 02:11 PM	81.4	25.7	42.0	56.6	67.7	72.1	74.3	75.5	74.4	72.9	66.3	52.7
02:11 PM - 03:11 PM	81.3	25.4	42.0	56.6	67.8	72.1	74.3	75.4	74.4	72.8	66.3	52.7
03:11 PM - 04:11 PM	81.3	25.5	41.8	56.6	67.9	72.1	74.3	75.4	74.5	72.9	66.2	52.7
04:11 PM - 05:11 PM	81.6	25.4	41.8	56.6	68.0	72.2	74.6	75.6	74.8	73.1	66.8	55.3
05:11 PM - 06:11 PM	81.7	25.2	41.3	56.5	67.8	72.3	74.5	75.8	75.0	73.3	66.7	54.0
06:11 PM - 07:11 PM	83.7	33.0	46.6	61.1	71.1	77.8	77.1	77.2	75.4	72.8	66.3	54.9
07:11 PM - 08:11 PM	88.8	40.8	53.4	68.2	76.5	85.1	82.3	81.3	77.8	71.3	60.7	43.6
Average	83.0	31.7	45.4	60.2	70.0	76.7	76.2	76.6	75.1	72.8	66.2	53.5

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rak Yong
Scientist (3)

Approved by

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Supot Salamteh
Section Head

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S:\Reports\Air Noise_Octave band rpt (10-42AM)



Analysis / Test Report

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Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136544
Date Received : Dec 18, 2024
Date Reported : Dec 24, 2024
Report Number : 3200986-1

Page 1 of 1

Sample Number 24136544-8
Parameter Octave band
Location K Tron PC1060 (3rd Floor)
Measurement Date Dec 17, 2024
Measurement By Tinnakorn Kumpasee

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:17 AM - 09:17 AM	83.4	23.9	49.3	52.5	67.2	72.8	75.6	76.2	76.4	76.5	73.5	63.2
09:17 AM - 10:17 AM	83.2	23.6	49.3	52.5	67.2	72.6	75.0	76.2	76.4	76.5	73.5	63.0
10:17 AM - 11:17 AM	83.1	22.8	49.0	51.9	67.4	72.5	75.2	75.6	76.0	76.6	73.7	63.2
11:17 AM - 12:17 PM	82.9	23.0	48.9	51.6	66.9	72.4	75.5	75.4	75.4	76.4	73.5	63.0
12:17 PM - 01:17 PM	82.8	23.1	48.9	51.7	65.8	72.2	76.1	75.0	74.8	76.4	73.5	63.0
01:17 PM - 02:17 PM	82.8	23.4	49.0	51.6	64.6	72.2	76.1	75.0	74.7	76.4	73.5	62.9
02:17 PM - 03:17 PM	82.6	23.5	49.1	51.8	64.5	72.3	75.6	74.6	74.5	76.4	73.5	63.0
03:17 PM - 04:17 PM	82.6	23.7	48.8	51.8	64.7	72.3	75.6	74.6	74.5	76.5	73.5	63.0
04:17 PM - 05:17 PM	82.8	24.1	49.2	52.0	64.8	72.6	75.2	74.9	75.0	76.7	73.8	63.3
05:17 PM - 06:17 PM	82.3	24.5	49.2	52.1	64.6	72.5	74.5	74.9	74.6	76.0	72.9	62.4
06:17 PM - 07:17 PM	82.6	29.7	48.6	55.3	66.7	73.6	74.9	75.7	75.0	75.8	72.0	61.8
07:17 PM - 08:17 PM	82.4	31.1	49.1	59.4	67.7	77.3	76.6	75.0	72.6	71.4	65.7	51.9
Average	82.8	25.7	49.0	53.6	66.2	73.2	75.5	75.3	75.1	76.1	73.1	62.6

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rak Yong
Scientist (3)

Approved by

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Supot Salamteh
Section Head

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S:\Reports\Air Noise_Octave band rpt (10-42AM)



Analysis / Test Report

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Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136544
Date Received : Dec 18, 2024
Date Reported : Dec 24, 2024
Report Number : 3200987-1

Page 1 of 1

Sample Number 24136544-9
Parameter Octave band
Location Control Room (1st Floor)
Measurement Date Dec 17, 2024
Measurement By Tinnakorn Kumpasee

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:29 AM - 09:29 AM	63.9	13.7	28.9	33.1	43.7	51.0	59.2	59.1	57.2	51.7	40.2	25.2
09:29 AM - 10:29 AM	63.8	11.9	25.7	32.6	42.5	48.1	57.6	57.5	60.0	53.1	41.0	27.5
10:29 AM - 11:29 AM	63.6	11.9	23.2	30.0	40.1	47.7	58.3	57.5	59.2	50.8	41.7	27.0
11:29 AM - 12:29 PM	65.7	14.7	27.7	34.3	45.0	51.2	60.0	59.1	61.7	53.6	41.7	26.2
12:29 PM - 01:29 PM	62.4	14.1	27.2	33.4	42.4	48.4	55.5	56.3	58.2	53.1	43.7	30.2
01:29 PM - 02:29 PM	65.7	15.7	31.0	38.9	44.8	52.4	61.6	60.8	58.4	52.1	44.3	31.0
02:29 PM - 03:29 PM	65.9	13.2	30.1	35.7	43.9	53.0	61.9	60.1	58.9	54.4	41.7	26.0
03:29 PM - 04:29 PM	66.7	13.7	28.7	33.3	43.7	53.0	61.6	62.2	60.5	53.8	41.5	25.9
04:29 PM - 05:29 PM	64.8	14.6	29.8	34.0	44.6	51.9	60.1	60.0	58.1	52.6	41.1	26.1
05:29 PM - 06:29 PM	67.0	13.7	28.9	45.4	45.0	53.6	64.3	59.6	58.2	55.0	52.7	35.3
06:29 PM - 07:29 PM	68.3	15.6	32.5	38.1	46.3	55.4	64.3	62.5	61.3	56.8	44.1	28.4
07:29 PM - 08:29 PM	68.0	15.0	30.0	34.6	45.0	54.3	62.9	63.5	61.8	55.1	42.8	27.2
Average	65.8	14.1	29.2	37.7	44.2	52.3	61.3	60.3	59.7	53.8	45.0	29.2

Reference Method : ANSI Standard S1.6-1984

Technical Management

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Orawan Rak Yong
Scientist (3)

Approved by

Supot S
Supot Salamteh
Section Head

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S:\Reports\Air Noise_Octave band rpt (10-43AM)



Analysis / Test Report

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Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136544
Date Received : Dec 18, 2024
Date Reported : Dec 24, 2024
Report Number : 3200988-1

Page 1 of 1

Sample Number 24136544-10
Parameter Octave band
Location BH 1101 4FI
Measurement Date Dec 17, 2024
Measurement By Tinnakorn Kumpasee

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:12 AM - 09:12 AM	88.3	33.4	49.4	55.4	71.7	77.6	82.8	85.7	74.8	72.2	66.5	49.0
09:12 AM - 10:12 AM	87.8	33.0	48.9	55.1	71.5	77.5	82.6	84.9	74.4	72.1	66.0	48.4
10:12 AM - 11:12 AM	87.7	32.8	48.6	54.9	71.8	77.4	82.6	84.7	73.5	71.7	65.9	48.2
11:12 AM - 12:12 PM	87.2	32.9	48.7	54.9	71.8	77.3	82.5	83.9	72.9	71.6	65.9	48.2
12:12 PM - 01:12 PM	86.8	32.9	48.5	55.1	72.0	77.6	82.5	82.8	73.1	71.5	65.9	48.1
01:12 PM - 02:12 PM	86.5	32.9	48.5	55.0	72.0	77.5	82.3	82.4	72.7	71.4	65.7	47.8
02:12 PM - 03:12 PM	86.3	33.1	48.6	55.0	72.0	77.4	82.2	81.9	72.2	70.9	65.6	47.7
03:12 PM - 04:12 PM	86.2	33.2	48.5	55.1	72.1	77.1	82.2	81.9	72.3	70.8	65.6	47.9
04:12 PM - 05:12 PM	86.2	33.0	48.6	55.3	72.0	77.1	82.3	81.9	72.2	70.8	65.6	48.0
05:12 PM - 06:12 PM	86.4	32.9	48.8	55.2	72.3	77.2	82.5	82.2	72.1	71.0	65.7	48.1
06:12 PM - 07:12 PM	86.7	32.9	48.8	56.3	73.7	79.3	82.2	82.1	73.1	71.6	65.9	49.2
07:12 PM - 08:12 PM	89.5	34.0	48.7	61.3	79.9	87.1	82.4	78.3	75.1	72.5	62.5	45.9
Average	87.3	33.1	48.7	56.2	73.6	79.8	82.4	83.1	73.3	71.5	65.7	48.1

Reference Method : ANSI Standard S1.6-1984

Technical Management

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Approved by

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Section Head

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Analysis / Test Report

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Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136544
Date Received : Dec 18, 2024
Date Reported : Dec 24, 2024
Report Number : 3200989-1

Page 1 of 1

Sample Number 24136544-11
Parameter Octave band
Location EM Room (1st Floor)
Measurement Date Dec 17, 2024
Measurement By Tinnakorn Kumpasee

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:17 PM - 09:17 PM	75.5	25.9	39.1	53.1	62.5	67.3	67.1	68.2	69.0	68.5	60.7	45.3
09:17 PM - 10:17 PM	75.7	25.8	39.3	53.7	63.1	67.8	67.5	68.4	69.1	68.5	60.8	45.5
10:17 PM - 11:17 PM	75.8	25.7	39.4	53.7	63.2	67.9	67.4	68.6	69.2	68.7	60.9	45.6
11:17 PM - 12:17 AM	76.6	25.7	39.6	54.2	63.9	68.5	68.6	69.7	69.9	68.9	61.2	46.2
12:17 AM - 01:17 AM	76.5	25.5	39.6	54.4	64.0	68.6	68.3	69.4	70.1	69.0	61.2	46.0
01:17 AM - 02:17 AM	76.1	25.5	39.6	54.1	63.7	68.3	67.8	68.9	69.4	68.8	61.0	45.6
02:17 AM - 03:17 AM	76.2	25.4	39.7	54.2	63.7	68.5	67.9	69.0	69.5	68.9	61.0	45.6
03:17 AM - 04:17 AM	76.1	25.5	39.5	53.9	63.3	68.3	67.7	68.9	69.4	68.9	61.0	45.6
04:17 AM - 05:17 AM	75.7	25.9	39.0	53.3	62.7	67.7	67.1	68.6	69.2	68.7	60.9	45.6
05:17 AM - 06:17 AM	76.1	26.0	39.4	53.9	63.3	68.3	67.5	69.1	69.5	68.9	61.0	45.6
06:17 AM - 07:17 AM	76.7	25.8	39.5	54.0	63.7	68.6	68.1	70.1	70.2	69.1	61.3	46.2
07:17 AM - 08:17 AM	76.4	25.8	39.5	53.9	63.4	68.3	67.7	69.2	70.5	69.1	61.4	46.0
Average	76.1	25.7	39.4	53.9	63.4	68.2	67.7	69.0	69.6	68.8	61.0	45.7

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rak Yong
Scientist (3)

Approved by

Supot S.
Supot Salamteh
Section Head

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S:\Reports\Air Noise_Octave band rpt (10-43AM)



Analysis / Test Report

Client : BASF (Thai) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Puakdaeng,
Amphur Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136544
Date Received : Dec 18, 2024
Date Reported : Dec 24, 2024
Report Number : 3200990-1

Page 1 of 1

Sample Number 24136544-12
Parameter Octave band
Location Utility Room (1st Floor)
Measurement Date Dec 17, 2024
Measurement By Tinnakorn Kumpasee

Time	Result (dB(A))											
	Leq	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
08:27 PM - 09:27 PM	87.7	27.6	42.8	55.4	66.2	71.6	76.3	81.9	81.1	83.1	76.5	56.3
09:27 PM - 10:27 PM	88.1	32.9	44.8	56.9	66.1	71.4	76.2	83.9	81.7	82.1	75.4	55.8
10:27 PM - 11:27 PM	88.9	32.6	44.9	57.1	66.9	71.6	76.5	84.3	82.0	83.7	76.9	57.4
11:27 PM - 12:27 AM	88.9	32.5	45.0	57.2	67.0	71.5	77.0	84.5	81.9	83.5	76.8	56.9
12:27 AM - 01:27 AM	89.1	32.6	44.9	57.2	66.8	71.7	77.8	83.7	82.0	84.5	77.8	57.5
01:27 AM - 02:27 AM	86.7	32.5	45.2	57.3	66.5	71.3	74.4	77.0	79.1	83.7	77.2	56.6
02:27 AM - 03:27 AM	85.4	26.8	42.1	55.0	65.8	71.3	74.4	77.1	78.8	81.5	74.9	55.0
03:27 AM - 04:27 AM	83.6	25.0	41.3	54.3	65.6	70.5	73.8	76.6	77.4	78.6	71.7	52.6
04:27 AM - 05:27 AM	85.3	32.6	45.2	57.0	65.6	70.5	79.3	80.6	79.0	75.8	66.7	51.1
05:27 AM - 06:27 AM	87.4	32.9	44.8	57.3	66.8	71.0	80.9	81.8	80.7	80.7	73.8	55.5
06:27 AM - 07:27 AM	88.7	32.5	44.9	57.4	67.1	71.4	80.4	82.2	81.4	84.1	77.3	58.3
07:27 AM - 08:27 AM	88.6	32.8	44.9	57.3	66.9	71.5	80.6	82.4	81.6	83.4	76.7	57.8
Average	87.7	31.8	44.4	56.7	66.5	71.3	78.0	82.1	80.8	82.6	75.9	56.3

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rak Yong
Scientist (3)

Approved by

Supot S.
Supot Salamteh
Section Head

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S:\Reports\Air Noise_Octave band rpt (10-43AM)



Analysis / Test Report

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111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Puakdaeng, Amphur
Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490733
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number : 3076455-1

Page 1 of 1

Sample Number 2490733-1
Sampled Date Aug 15, 2024
Sample Description Noise Dose
Location Mechanical Technician
Personal Sampling ศุภสกล วัฒน
Date Analysis Commenced Aug 17, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (8 hrs.)	08:00 AM - 04:00 PM	%	-	1	81.3	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	08:00 AM - 04:00 PM	dB(A)	-	-	84.1	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)

Note : LCPeak = 138.0 dB(A) Lmax = 123.0 dB (A)

Sampled By : Nattakorn Vongyioo

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

Approved by

Supot S.
Supot Salamteh
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Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490730
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number : 3076454-1

Page 1 of 4

Sample Number 2490730-1
Sampled Date Aug 15, 2024
Sample Description Noise Dose
Location Operator Technician
Personal Sampling ศุภสกล วัฒน
Date Analysis Commenced Aug 17, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	08:00 AM - 08:00 PM	%	-	1	26.9	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	08:00 AM - 08:00 PM	%	-	1	25.1	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	08:00 AM - 08:00 PM	dB(A)	-	-	77.3	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	08:00 AM - 08:00 PM	dB(A)	-	-	79.0	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL : Recommended guideline limit for 12 working hours should not be over 83 dB(A)

Note : LCPeak = 131.9 dB(A) Lmax = 104.9 dB (A)

Sampled By : Nattakorn Vongyioo

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

Approved by

Supot S.
Supot Salamteh
Section Head

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Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490730
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number : 3076454-1

Page 2 of 4

Sample Number	2490730-2
Sampled Date	Aug 15, 2024
Sample Description	Noise Dose
Location	Shift Leader
Personal Sampling	การสุ่มตัวอย่าง
Date Analysis Commenced	Aug 17, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	08:00 AM - 08:00 PM	%	-	1	11.2	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	08:00 AM - 08:00 PM	%	-	1	10.7	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	08:00 AM - 08:00 PM	dB(A)	-	-	73.5	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	08:00 AM - 08:00 PM	dB(A)	-	-	75.3	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)
Note : LCpeak = 128.2 dB(A) Lmax = 106.6 dB (A)

Sampled By : Nattakam Vonginyoo

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

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Supt Salameh

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Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490730
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number : 3076454-1

Page 3 of 4

Sample Number	2490730-3
Sampled Date	Aug 15, 2024
Sample Description	Noise Dose
Location	EBI Technician
Personal Sampling	การสุ่มตัวอย่าง
Date Analysis Commenced	Aug 17, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	08:00 AM - 08:00 PM	%	-	1	53.7	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	08:00 AM - 08:00 PM	%	-	1	51.3	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	08:00 AM - 08:00 PM	dB(A)	-	-	80.3	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	08:00 AM - 08:00 PM	dB(A)	-	-	82.1	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)
Note : LCpeak = 145.8 dB(A) Lmax = 116.6 dB (A)

Sampled By : Nattakam Vonginyoo

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

Approved by

Supt Salameh

Section Head

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Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490730
Date Received : Aug 16, 2024
Date Reported : Aug 21, 2024
Report Number : 3076454-1

Page 4 of 4

Sample Number	2490730-4
Sampled Date	Aug 15, 2024
Sample Description	Noise Dose
Location	Packaging Technician
Personal Sampling	การสุ่มตัวอย่าง
Date Analysis Commenced	Aug 17, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	08:00 AM - 08:00 PM	%	-	1	38.0	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	08:00 AM - 08:00 PM	%	-	1	35.5	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	08:00 AM - 08:00 PM	dB(A)	-	-	78.8	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	08:00 AM - 08:00 PM	dB(A)	-	-	80.5	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)
Note : LCpeak = 146.7 dB(A) Lmax = 121.7 dB (A)

Sampled By : Nattakam Vonginyoo

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

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Supt Salameh

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Analysis / Test Report

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111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Puakdaeng, Amphur
Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136549
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number : 3181552-1

Page 1 of 1

Sample Number	24136549-1
Sampled Date	Dec 17, 2024
Sample Description	Noise Dose
Location	Mechanical Technician
Personal Sampling	การสุ่มตัวอย่าง
Date Analysis Commenced	Dec 19, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (8 hrs.)	07:30 AM - 03:30 PM	%	-	1	41.7	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	07:30 AM - 03:30 PM	dB(A)	-	-	81.2	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :
MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
Note : LCpeak = 126.5 dB(A), Lmax = 109.2 dB (A)

Sampled By : Tinnakorn Kumpasae

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

Approved by

Supt Salameh

Section Head

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Analysis / Test Report

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Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136546
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number : 3181550-1

Page 1 of 4

Sample Number	24136546-1
Sampled Date	Dec 17, 2024
Sample Description	Noise Dose
Location	Operator Technician
Personal Sampling	บุคลากรช่างเทคนิค
Date Analysis Commenced	Dec 19, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	07:30 AM - 07:30 PM	%	-	1	155	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	07:30 AM - 07:30 PM	%	-	1	148	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	07:30 AM - 07:30 PM	dB(A)	-	-	84.9	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	07:30 AM - 07:30 PM	dB(A)	-	-	86.7	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :

MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)

Note : L_{Cpeak} = 146.1 dB(A), L_{max} = 122.9 dB (A)

Sampled By : Tinnakorn Kumpasee

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

Approved by

Supt S

Supt Salameh
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Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136546
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number : 3181550-1

Page 2 of 4

Sample Number	24136546-2
Sampled Date	Dec 17, 2024
Sample Description	Noise Dose
Location	Shift Leader
Personal Sampling	หัวหน้ากะดึก (เปลี่ยนกะ)
Date Analysis Commenced	Dec 19, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	07:30 AM - 07:30 PM	%	-	1	81.3	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	07:30 AM - 07:30 PM	%	-	1	77.6	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	07:30 AM - 07:30 PM	dB(A)	-	-	82.1	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	07:30 AM - 07:30 PM	dB(A)	-	-	83.9	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :

MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)

Note : L_{Cpeak} = 133.7 dB(A), L_{max} = 120.9 dB (A)

Sampled By : Tinnakorn Kumpasee

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

Approved by

Supt S

Supt Salameh
Section Head

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Analysis / Test Report

Client : BASF (Thai) Limited
111/3, 111/5 Moo 4, Eastern Seaboard Industrial Estate, Tambol Puakdaeng, Amphur
Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136546
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number : 3181550-1

Page 3 of 4

Sample Number	24136546-3
Sampled Date	Dec 17, 2024
Sample Description	Noise Dose
Location	E&I Technician
Personal Sampling	บุคลากรช่างเทคนิค
Date Analysis Commenced	Dec 19, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	07:30 AM - 07:30 PM	%	-	1	85.1	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	07:30 AM - 07:30 PM	%	-	1	79.4	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	07:30 AM - 07:30 PM	dB(A)	-	-	82.3	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	07:30 AM - 07:30 PM	dB(A)	-	-	84.0	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :

MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)

Note : L_{Cpeak} = 133.2 dB(A), L_{max} = 106.3 dB (A)

Sampled By : Tinnakorn Kumpasee

Remark :
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Supt S

Supt Salameh
Section Head

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136546
Date Received : Dec 18, 2024
Date Reported : Dec 20, 2024
Report Number : 3181550-1

Page 4 of 4

Sample Number	24136546-4
Sampled Date	Dec 17, 2024
Sample Description	Noise Dose
Location	Packaging Technician
Personal Sampling	บุคลากรบรรจุภัณฑ์
Date Analysis Commenced	Dec 19, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (12 hrs.) (Calculated from Lavg)	07:30 AM - 07:30 PM	%	-	1	81.3	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
Noise Dose (8 hrs.)	07:30 AM - 07:30 PM	%	-	1	77.6	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (12 hrs.) (Calculated from Lavg)	07:30 AM - 07:30 PM	dB(A)	-	-	82.1	83*	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	07:30 AM - 07:30 PM	dB(A)	-	-	83.9	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :

MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
* MOL: Recommended guideline limit for 12 working hours should not be over 83 dB(A)

Note : L_{Cpeak} = 133.7 dB(A), L_{max} = 120.9 dB (A)

Sampled By : Tinnakorn Kumpasee

Remark :
- LOD : Limit of Detection
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Approved by

Supt S

Supt Salameh
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Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490736
Date Received : Aug 16, 2024
Date Reported : Aug 22, 2024
Report Number : 3076576-1

Page 1 of 10

Sample Number 2490736-1
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location Packaging Area
Date Analysis Commenced Aug 20, 2024
Condition of Sample Drawn into two filter papers placed in each cassette
Barometric Pressure 756 mmHg
Atmospheric Temperature 33.6 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:00 AM - 11:00 PM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong
Total Dust	09:00 AM - 11:00 AM	mg/m ³	-	0.15	<0.15	15	Based on NIOSH (1994), 0500	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Ronnachai Moungma

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

Approved by

Thanitak.

Thanita Kulsuriwong
Scientist (4)

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490736
Date Received : Aug 16, 2024
Date Reported : Aug 22, 2024
Report Number : 3076576-1

Page 2 of 10

Sample Number 2490736-2
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location Roller Mill Area
Date Analysis Commenced Aug 20, 2024
Condition of Sample Drawn into two filter papers placed in each cassette
Barometric Pressure 756 mmHg
Atmospheric Temperature 33.6 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:00 AM - 11:00 PM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong
Total Dust	09:00 AM - 11:00 AM	mg/m ³	-	0.15	<0.15	15	Based on NIOSH (1994), 0500	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Ronnachai Moungma

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

Approved by

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Thanita Kulsuriwong
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490736
Date Received : Aug 16, 2024
Date Reported : Aug 22, 2024
Report Number : 3076576-1

Page 3 of 10

Sample Number 2490736-3
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location EM Room area
Date Analysis Commenced Aug 20, 2024
Condition of Sample Drawn into two filter papers placed in each cassette
Barometric Pressure 756 mmHg
Atmospheric Temperature 33.6 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:00 AM - 11:00 PM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong
Total Dust	09:00 AM - 11:00 AM	mg/m ³	-	0.15	<0.15	15	Based on NIOSH (1994), 0500	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Ronnachai Moungma

Remark :
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Approved by

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490736
Date Received : Aug 16, 2024
Date Reported : Aug 22, 2024
Report Number : 3076576-1

Page 4 of 10

Sample Number 2490736-4
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location Zig Zag Area
Date Analysis Commenced Aug 20, 2024
Condition of Sample Drawn into two filter papers placed in each cassette
Barometric Pressure 756 mmHg
Atmospheric Temperature 33.6 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:00 AM - 11:00 PM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong
Total Dust	09:00 AM - 11:00 AM	mg/m ³	-	0.15	<0.15	15	Based on NIOSH (1994), 0500	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Ronnachai Moungma

Remark :
- LOD : Limit of Detection
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490736
Date Received : Aug 16, 2024
Date Reported : Aug 22, 2024
Report Number : 3076576-1

Page 5 of 10

Sample Number 2490736-5
Sampled Date Aug 16, 2024
Sample Description Air Quality
Location TS Lab
Date Analysis Commenced Aug 20, 2024
Condition of Sample Drawn into two filter papers placed in each cassette
Barometric Pressure 756 mmHg
Atmospheric Temperature 26.4 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:00 AM - 11:00 PM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong
Total Dust	09:00 AM - 11:00 AM	mg/m ³	-	0.15	<0.15	15	Based on NIOSH (1994), 0500	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Ronnachai Moungma

Remark :
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490736
Date Received : Aug 16, 2024
Date Reported : Aug 22, 2024
Report Number : 3076576-1

Page 6 of 10

Sample Number 2490736-6
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location Shift Leader
Personal Sampling ศุลภากรกิจ จักรกร
Date Analysis Commenced Aug 20, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 756 mmHg
Atmospheric Temperature 33.6 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	08:30 AM - 10:30 AM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Ronnachai Moungma

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

Approved by

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490736
Date Received : Aug 16, 2024
Date Reported : Aug 22, 2024
Report Number : 3076576-1

Page 7 of 10

Sample Number 2490736-7
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location Packaging Technician
Personal Sampling ศุลภากรกิจ ชัยพรชัย
Date Analysis Commenced Aug 20, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 756 mmHg
Atmospheric Temperature 33.6 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	08:30 AM - 10:30 AM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Ronnachai Moungma

Remark :
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490736
Date Received : Aug 16, 2024
Date Reported : Aug 22, 2024
Report Number : 3076576-1

Page 8 of 10

Sample Number 2490736-8
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location Operator Technician
Personal Sampling ศุลภากรกิจ ชัยพรชัย
Date Analysis Commenced Aug 20, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 756 mmHg
Atmospheric Temperature 33.6 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	08:30 AM - 10:30 AM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Ronnachai Moungma

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

Approved by

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490736
Date Received : Aug 16, 2024
Date Reported : Aug 22, 2024
Report Number : 3076576-1

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Sample Number 2490736-9
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location Mechanical Technician
Personal Sampling อาสาสมัคร ฝึกอบรม
Date Analysis Commenced Aug 20, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 756 mmHg
Atmospheric Temperature 33.6 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	08:30 AM - 10:30 AM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Ronnachai Moungma

Remark :
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490736
Date Received : Aug 16, 2024
Date Reported : Aug 22, 2024
Report Number : 3076576-1

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Sample Number 2490736-10
Sampled Date Aug 16, 2024
Sample Description Air Quality
Location TS Technician
Personal Sampling อาสาสมัคร ฝึกอบรม
Date Analysis Commenced Aug 20, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 756 mmHg
Atmospheric Temperature 26.4 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:00 AM - 11:00 AM	mg/m ³	-	0.15	0.53	5	Based on NIOSH (1998), 0600	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Ronnachai Moungma

Remark :
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Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490718
Date Received : Aug 16, 2024
Date Reported : Aug 31, 2024
Report Number : 3076443-1

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Sample Number 2490718-1
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location AA Storage Tank area
Date Analysis Commenced Aug 17, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 34.3 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	01:30 PM - 03:30 PM	ppm	-	0.10	<0.10	2	Based on OSHA, 28	MOL	Bangkok

Guideline :
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Sampled By : Ronnachai Moungma

Remark :
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490718
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Sample Number 2490718-2
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location Mix Tank Room area 1st
Date Analysis Commenced Aug 17, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 34.3 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	01:30 PM - 03:30 PM	ppm	-	0.10	2.11	2	Based on OSHA, 28	MOL	Bangkok

Guideline :
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Sampled By : Ronnachai Moungma

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490718
Date Received : Aug 16, 2024
Date Reported : Aug 31, 2024
Report Number : 3076443-1

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Sample Number 2490718-3
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location Mix Tank Room area 2nd
Date Analysis Commenced Aug 17, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 34.3 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	01:30 PM - 03:30 PM	ppm	-	0.10	0.57	2	Based on OSHA, 28	MOL	Bangkok

Guideline :
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Sampled By : Ronnachai Moungma

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Project Name : Monitoring
Project Location :

Lot ID: 2490718
Date Received : Aug 16, 2024
Date Reported : Aug 31, 2024
Report Number : 3076443-1

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Sample Number 2490718-4
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location Stripping column 3rd floor
Date Analysis Commenced Aug 17, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 34.3 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	01:30 PM - 03:30 PM	ppm	-	0.10	0.53	2	Based on OSHA, 28	MOL	Bangkok

Guideline :
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Sampled By : Ronnachai Moungma

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Project Name : Monitoring
Project Location :

Lot ID: 2490718
Date Received : Aug 16, 2024
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Sample Number 2490718-5
Sampled Date Aug 16, 2024
Sample Description Air Quality
Location QA lab
Date Analysis Commenced Aug 17, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 26.4 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	09:00 AM - 11:00 AM	ppm	-	0.10	<0.10	2	Based on OSHA, 28	MOL	Bangkok

Guideline :
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Sampled By : Ronnachai Moungma

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Project Location :

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Sample Number 2490718-6
Sampled Date Aug 16, 2024
Sample Description Air Quality
Location RD lab
Date Analysis Commenced Aug 17, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 26.4 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	09:00 AM - 11:00 AM	ppm	-	0.10	<0.10	2	Based on OSHA, 28	MOL	Bangkok

Guideline :
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 2490718
Date Received : Aug 16, 2024
Date Reported : Aug 31, 2024
Report Number : 3076443-1

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Sample Number	2490718-7
Sampled Date	Aug 15, 2024
Sample Description	Air Quality
Location	Unloading Technician
Personal Sampling	บุคลากร: ชวนชัย
Date Analysis Commenced	Aug 17, 2024
Condition of Sample	Drawn into one filter paper placed in plastic cassette and two sorbent tubes, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	34.3 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	01:30 PM - 03:30 PM	ppm	-	0.10	<0.10	2	Based on OSHA, 28	MOL	Bangkok
Propylene glycol	01:30 PM - 03:30 PM	ppm	-	0.10	<0.10	No Standard	NIOSH (1994), 5523	-	Bangkok
Sodium hydroxide as NaOH	01:30 PM - 03:30 PM	mg/m3	-	0.05	<0.05	2	NIOSH (1994), 7401	MOL	Rayong

Guideline :
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Sampled By : Ronnachai Moungma

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Project Location :

Lot ID: 2490718
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Sample Number	2490718-8
Sampled Date	Aug 15, 2024
Sample Description	Air Quality
Location	Operator Technician
Personal Sampling	บุคลากร: ชวนชัย
Date Analysis Commenced	Aug 17, 2024
Condition of Sample	Drawn into two sorbent tubes, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	33.6 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	08:30 AM - 10:30 AM	ppm	-	0.10	<0.10	2	Based on OSHA, 28	MOL	Bangkok
Propylene glycol	08:30 AM - 10:30 AM	ppm	-	0.10	<0.10	No Standard	NIOSH (1994), 5523	-	Bangkok

Guideline :
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Project Location :

Lot ID: 2490718
Date Received : Aug 16, 2024
Date Reported : Aug 31, 2024
Report Number : 3076443-1

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Sample Number	2490718-9
Sampled Date	Aug 15, 2024
Sample Description	Air Quality
Location	PG Storage Tank area
Date Analysis Commenced	Aug 17, 2024
Condition of Sample	Drawn into one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	34.3 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Propylene glycol	01:30 PM - 03:30 PM	ppm	-	0.10	<0.10	No Standard	NIOSH (1994), 5523	-	Bangkok

Guideline :
Sampled By : Ronnachai Moungma

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Sample Number	2490718-10
Sampled Date	Aug 15, 2024
Sample Description	Air Quality
Location	Coating Room area
Date Analysis Commenced	Aug 17, 2024
Condition of Sample	Drawn into one sorbent tube, refrigerated
Barometric Pressure	756 mmHg
Atmospheric Temperature	34.3 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Propylene glycol	01:30 PM - 03:30 PM	ppm	-	0.10	<0.10	No Standard	NIOSH (1994), 5523	-	Bangkok

Guideline :
Sampled By : Ronnachai Moungma

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Sample Number 2490718-11
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location Initiator Room
Date Analysis Commenced Aug 17, 2024
Condition of Sample Drawn into two amber plastic bottles, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 34.3 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Hydrogen Peroxide	01:30 PM - 03:30 PM	ppm	-	0.08	<0.08	1	OSHA, V16	MOL	Bangkok
Sulfur dioxide	01:30 PM - 03:30 PM	ppm	-	0.004	<0.004	5	NIOSH (1994), P&CAM146	MOL	Bangkok

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Project Location :

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Sample Number 2490718-12
Sampled Date Aug 16, 2024
Sample Description Air Quality
Location RD lab
Date Analysis Commenced Aug 17, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette and one amber plastic bottle, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 26.5 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Hydrogen Peroxide	09:00 AM - 11:00 AM	ppm	-	0.08	<0.08	1	OSHA, V16	MOL	Bangkok
Sodium hydroxide as NaOH	09:00 AM - 11:00 AM	mg/m3	-	0.05	<0.05	2	NIOSH (1994), 7401	MOL	Rayong

Guideline :
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Sample Number 2490718-13
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location Oxidizing Warehouse
Date Analysis Commenced Aug 17, 2024
Condition of Sample Drawn into one amber plastic bottle, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 34.3 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Hydrogen Peroxide	01:30 PM - 03:30 PM	ppm	-	0.08	<0.08	1	OSHA, V16	MOL	Bangkok

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Date Received : Aug 16, 2024
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Sample Number 2490718-14
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location NaOH unloading
Date Analysis Commenced Aug 19, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 756 mmHg
Atmospheric Temperature 34.3 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Sodium hydroxide as NaOH	01:30 PM - 03:30 PM	mg/m3	-	0.05	<0.05	2	NIOSH (1994), 7401	MOL	Rayong

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Project Location :

Lot ID: 2490718

Date Received : Aug 16, 2024

Date Reported : Aug 31, 2024

Report Number : 3076443-1

Page 15 of 16

Sample Number 2490718-15
Sampled Date Aug 15, 2024
Sample Description Air Quality
Location Utility room
Date Analysis Commenced Aug 19, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 756 mmHg
Atmospheric Temperature 33.6 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Sodium hydroxide as NaOH	09:00 AM - 11:00 AM	mg/m ³	-	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 : Ronnachai Moungma

Remark :

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

Approved by

Thanitak.

Thanita Kulsuriwong
Scientist (4)

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P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 2490718

Date Received : Aug 16, 2024

Date Reported : Aug 31, 2024

Report Number : 3076443-1

Page 16 of 16

Sample Number 2490718-16
Sampled Date Aug 16, 2024
Sample Description Air Quality
Location QA lab
Date Analysis Commenced Aug 19, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 756 mmHg
Atmospheric Temperature 26.4 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Sodium hydroxide as NaOH	09:00 AM - 11:00 AM	mg/m ³	-	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 : Ronnachai Moungma

Remark :

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P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136551

Date Received : Dec 16, 2024

Date Reported : Dec 20, 2024

Report Number : 3181554-1

Page 1 of 10

Sample Number 24136551-1
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Packaging Area
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into two filter papers placed in each cassette
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:30 AM - 11:30 AM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong
Total Dust	09:30 AM - 11:30 AM	mg/m ³	-	0.15	0.21	15	Based on NIOSH (1994), 0500	OSHA	Rayong

Guideline :

OSHA : Occupational Safety and Health Administration

Sampled By : Prasansmit Kueangpet

Remark :

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

Approved by

Thanitak.

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Scientist (4)

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Puakdaeng, Rayong Thailand 21140

P/O : 4984975585

Project Name : Monitoring

Project Location :

Lot ID: 24136551

Date Received : Dec 16, 2024

Date Reported : Dec 20, 2024

Report Number : 3181554-1

Page 2 of 10

Sample Number 24136551-2
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Roller Mill Area
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into two filter papers placed in each cassette
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:30 AM - 11:30 AM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong
Total Dust	09:30 AM - 11:30 AM	mg/m ³	-	0.15	<0.15	15	Based on NIOSH (1994), 0500	OSHA	Rayong

Guideline :

OSHA : Occupational Safety and Health Administration

Sampled By : Prasansmit Kueangpet

Remark :

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

Approved by

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Thanita Kulsuriwong
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136551
Date Received : Dec 16, 2024
Date Reported : Dec 20, 2024
Report Number : 3181554-1

Page 3 of 10

Sample Number 24136551-3
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location EM Room area
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into two filter papers placed in each cassette
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:30 AM - 11:30 AM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong
Total Dust	09:30 AM - 11:30 AM	mg/m ³	-	0.15	0.21	15	Based on NIOSH (1994), 0500	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Prasarnmit Kueanpet

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

Approved by

Thanitak.

Thanita Kulsuriwong
Scientist (4)

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136551
Date Received : Dec 16, 2024
Date Reported : Dec 20, 2024
Report Number : 3181554-1

Page 4 of 10

Sample Number 24136551-4
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Zig Zag Area
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into two filter papers placed in each cassette
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:30 AM - 11:30 AM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong
Total Dust	09:30 AM - 11:30 AM	mg/m ³	-	0.15	<0.15	15	Based on NIOSH (1994), 0500	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Prasarnmit Kueanpet

Remark :
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136551
Date Received : Dec 16, 2024
Date Reported : Dec 20, 2024
Report Number : 3181554-1

Page 5 of 10

Sample Number 24136551-5
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location TS Lab
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into two filter papers placed in each cassette
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:30 AM - 11:30 AM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong
Total Dust	09:30 AM - 11:30 AM	mg/m ³	-	0.15	<0.15	15	Based on NIOSH (1994), 0500	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Prasarnmit Kueanpet

Remark :
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136551
Date Received : Dec 16, 2024
Date Reported : Dec 20, 2024
Report Number : 3181554-1

Page 6 of 10

Sample Number 24136551-6
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Shift Leader
Personal Sampling พนักงานขับรถบรรทุก
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:15 AM - 11:15 AM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Prasarnmit Kueanpet

Remark :
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136551
Date Received : Dec 16, 2024
Date Reported : Dec 20, 2024
Report Number : 3181554-1

Page 7 of 10

Sample Number 24136551-7
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Packaging Technician
Personal Sampling ศศศิวิมล เทพพิทักษ์
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:15 AM - 11:15 AM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Prasanmit Kueanpet

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

Approved by

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Thanita Kulsuriwong
Scientist (4)

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136551
Date Received : Dec 16, 2024
Date Reported : Dec 20, 2024
Report Number : 3181554-1

Page 8 of 10

Sample Number 24136551-8
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Operator Technician
Personal Sampling ศศศิวิมล เทพพิทักษ์
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:15 AM - 11:15 AM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Prasanmit Kueanpet

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

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136551
Date Received : Dec 16, 2024
Date Reported : Dec 20, 2024
Report Number : 3181554-1

Page 9 of 10

Sample Number 24136551-9
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Mechanical Technician
Personal Sampling ศศศิวิมล เทพพิทักษ์
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:15 AM - 11:15 AM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Prasanmit Kueanpet

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

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136551
Date Received : Dec 16, 2024
Date Reported : Dec 20, 2024
Report Number : 3181554-1

Page 10 of 10

Sample Number 24136551-10
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location TS Technician
Personal Sampling ศศศิวิมล เทพพิทักษ์
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Respirable Dust	09:15 AM - 11:15 AM	mg/m ³	-	0.15	<0.15	5	Based on NIOSH (1998), 0600	OSHA	Rayong

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Prasanmit Kueanpet

Remark :
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Thanita Kulsuriwong
Scientist (4)

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136529
Date Received : Dec 16, 2024
Date Reported : Jan 04, 2025
Report Number : 3181515-1

Page 1 of 16

Sample Number 24136529-1
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location AA Storage Tank area
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	09:40 AM - 11:40 AM	ppm	-	0.10	<0.10	2	Based on OSHA, 28	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 : Prasannit Kueanpet

Remark :
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Approved by

Orawan R.
Orawan Rakying
Scientist (3)

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136529
Date Received : Dec 16, 2024
Date Reported : Jan 04, 2025
Report Number : 3181515-1

Page 2 of 16

Sample Number 24136529-2
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Mix Tank Room area 1st
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	09:40 AM - 11:40 AM	ppm	-	0.10	0.52	2	Based on OSHA, 28	MOL	Bangkok

Guideline :

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Sampled By : Prasannit Kueanpet

Remark :
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Approved by

Orawan R.
Orawan Rakying
Scientist (3)

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Puakdaeng, Rayong Thailand 21140
P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136529
Date Received : Dec 16, 2024
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Sample Number 24136529-3
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Mix Tank Room area 2nd
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	09:40 AM - 11:40 AM	ppm	-	0.10	<0.10	2	Based on OSHA, 28	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 : Prasannit Kueanpet

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

Approved by

Orawan R.
Orawan Rakying
Scientist (3)

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136529
Date Received : Dec 16, 2024
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Sample Number 24136529-4
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Stripping column 3rd floor
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	09:40 AM - 11:40 AM	ppm	-	0.10	0.34	2	Based on OSHA, 28	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 : Prasannit Kueanpet

Remark :
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136529
Date Received : Dec 16, 2024
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Sample Number 24136529-5
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location QA lab
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	09:40 AM - 11:40 AM	ppm	-	0.10	<0.10	2	Based on OSHA, 28	MOL	Bangkok

Guideline :

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Sampled By : Prasarnmit Kueanpet

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136529
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Sample Number 24136529-6
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location RD lab
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	09:40 AM - 11:40 AM	ppm	-	0.10	<0.10	2	Based on OSHA, 28	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 : Prasarnmit Kueanpet

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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136529
Date Received : Dec 16, 2024
Date Reported : Jan 04, 2025
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Sample Number 24136529-7
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Unloading Technician
Personal Sampling ศาสตราจารย์ ดร.อานนท์
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette and two sorbent tubes, refrigerated
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	09:30 AM - 11:30 AM	ppm	-	0.10	<0.10	2	Based on OSHA, 28	MOL	Bangkok
Propylene glycol	09:30 AM - 11:30 AM	ppm	-	0.10	<0.10	No Standard	NIOSH (1994), 5523	-	Bangkok
Sodium hydroxide as NaOH	09:30 AM - 11:30 AM	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 : Prasarnmit Kueanpet

Remark :
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136529
Date Received : Dec 16, 2024
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Sample Number 24136529-8
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Operator Technician
Personal Sampling ศาสตราจารย์ ดร.อานนท์
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into two sorbent tubes, refrigerated
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Acrylic acid	09:30 AM - 11:30 AM	ppm	-	0.10	<0.10	2	Based on OSHA, 28	MOL	Bangkok
Propylene glycol	09:30 AM - 11:30 AM	ppm	-	0.10	<0.10	No Standard	NIOSH (1994), 5523	-	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 : Prasarnmit Kueanpet

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Project Name : Monitoring
Project Location :

Lot ID: 24136529
Date Received : Dec 16, 2024
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Sample Number 24136529-9
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location PG Storage Tank area
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Propylene glycol	09:40 AM - 11:40 AM	ppm	-	0.10	<0.10	No Standard	NIOSH (1994), 5523	-	Bangkok

Guideline :
Sampled By : Prasannit Kueanpet

Remark :
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136529
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Sample Number 24136529-10
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Coating Room area
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Propylene glycol	09:40 AM - 11:40 AM	ppm	-	0.10	<0.10	No Standard	NIOSH (1994), 5523	-	Bangkok

Guideline :
Sampled By : Prasannit Kueanpet

Remark :
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Project Location :

Lot ID: 24136529
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Sample Number 24136529-11
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Initiator Room
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into two amber plastic bottles, refrigerated
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Hydrogen Peroxide	09:40 AM - 11:40 AM	ppm	-	0.08	<0.08	1	OSHA, V16	MOL	Bangkok
Sulfur dioxide	09:40 AM - 11:40 AM	ppm	-	0.004	<0.004	5	NIOSH (1994), P8CAM146	MOL	Bangkok

Guideline :
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Sampled By : Prasannit Kueanpet

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Project Name : Monitoring
Project Location :

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Sample Number 24136529-12
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location RD lab
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette and one amber plastic bottle, refrigerated
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Hydrogen Peroxide	09:40 AM - 11:40 AM	ppm	-	0.08	<0.08	1	OSHA, V16	MOL	Bangkok
Sodium hydroxide as NaOH	09:40 AM - 11:40 AM	mg/m3	-	0.05	<0.05	2	NIOSH (1994), 7401	MOL	Rayong

Guideline :
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Sampled By : Prasannit Kueanpet

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Project Location :

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Sample Number 24136529-13
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Oxidizing Warehouse
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one amber plastic bottle, refrigerated
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Hydrogen Peroxide	09:40 AM - 11:40 AM	ppm	-	0.08	<0.08	1	OSHA, V16	MOL	Bangkok

Guideline :

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Sample Number 24136529-14
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location NaOH unloading
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Sodium hydroxide as NaOH	09:40 AM - 11:40 AM	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)
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Sample Number 24136529-15
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location Utility room
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Sodium hydroxide as NaOH	09:40 AM - 11:40 AM	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)
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P/O : 4984975585
Project Name : Monitoring
Project Location :

Lot ID: 24136529
Date Received : Dec 16, 2024
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Sample Number 24136529-16
Sampled Date Dec 16, 2024
Sample Description Air Quality
Location QA lab
Date Analysis Commenced Dec 17, 2024
Condition of Sample Drawn into one filter paper placed in plastic cassette
Barometric Pressure 759 mmHg
Atmospheric Temperature 29.1 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Sodium hydroxide as NaOH	09:40 AM - 11:40 AM	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)
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รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Stack (CEM)	Oxides of Nitrogen	Analyzer - System calibration, Stand	-	-	-	-
Stack	Acrylic Acid	Console Control Unit	RYG_F50315	10-Jul-24	10-Jan-25	6
Stack	Acrylic Acid	Pitot Tube	RYG_F50321	10-Jul-24	10-Jan-25	6
Stack	Acrylic Acid	Flue gas Analyzer	RYG_F50464	8-Mar-24	7-Mar-25	12
Stack	Acrylic Acid	Field Rotameter	BKK_F51039	2-Oct-24	2-Jan-25	3
Stack	Acrylic Acid	HPLC	BKK_FL0036	16-Jan-24	16-Jan-25	18
Stack	Total Suspended Particulate	Console Control Unit	RYG_F50315	10-Jul-24	10-Jan-25	6
Stack	Total Suspended Particulate	Pitot Tube	RYG_F50321	10-Jul-24	10-Jan-25	6
Stack	Total Suspended Particulate	Flue gas Analyzer	RYG_F50464	8-Mar-24	7-Mar-25	12
Stack	Total Suspended Particulate	Digital Balance	BKK_EN0309	5-Nov-24	5-Nov-25	12
Stack	Total VOC	Console Control Unit	RYG_F50315	10-Jul-24	10-Jan-25	6
Stack	Total VOC	Pitot Tube	RYG_F50321	10-Jul-24	10-Jan-25	6
Stack	Total VOC	Flue gas Analyzer	RYG_F50464	8-Mar-24	7-Mar-25	12
Stack	Total VOC	FID Analyzer	BKK_F50758	1-Jul-24	1-Jan-25	6
Ambient	Total Suspended Particulate	High Volume	RYG_F50664	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_F50661	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	RYG_EN0001	22-Feb-24	22-Feb-25	12
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_F50264	2-Jul-24	2-Jan-25	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_F50261	2-Jul-24	2-Jan-25	6
Noise	Leq 24 hrs	Sound Calibrator	RYG_F50496	26-Jan-24	25-Jan-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_F50622	22-Jan-24	21-Jan-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_F50629	22-Jan-24	21-Jan-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_F50627	22-Jan-24	21-Jan-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_F50628	22-Jan-24	21-Jan-25	12
Noise	Leq 12 hrs & Octave band	Sound Calibrator	RYG_F50496	26-Jan-24	25-Jan-25	12
Noise	Leq 12 hrs & Octave band	Sound Level Meter	RYG_F50020	22-Jan-24	21-Jan-25	12
Noise	Leq 12 hrs & Octave band	Sound Level Meter	RYG_F50025	25-Jan-24	24-Jan-25	12
Noise	Leq 12 hrs & Octave band	Sound Level Meter	RYG_F50026	25-Jan-24	24-Jan-25	12
Noise	Leq 12 hrs & Octave band	Sound Level Meter	RYG_F50384	19-Oct-23	19-Oct-24	12
Noise	Leq 12 hrs & Octave band	Sound Level Meter	RYG_F50386	19-Oct-23	19-Oct-24	12
Noise	Leq 12 hrs & Octave band	Sound Level Meter	RYG_F50388	5-Jan-24	4-Jan-25	12
Noise	Leq 12 hrs & Octave band	Sound Calibrator	RYG_F50213	28-Feb-24	27-Feb-25	12
Noise	Leq 12 hrs & Octave band	Sound Level Meter	RYG_F50016	19-Sep-24	19-Sep-25	12
Noise	Leq 12 hrs & Octave band	Sound Level Meter	RYG_F50017	22-Jan-24	21-Jan-25	12
Noise	Leq 12 hrs & Octave band	Sound Level Meter	RYG_F50019	22-Jan-24	21-Jan-25	12
Noise	Leq 12 hrs & Octave band	Sound Level Meter	RYG_F50020	22-Jan-24	21-Jan-25	12
Noise	Leq 12 hrs & Octave band	Sound Level Meter	RYG_F50023	22-Jan-24	21-Jan-25	12
Noise	Leq 12 hrs & Octave band	Sound Level Meter	RYG_F50024	25-Jan-24	24-Jan-25	12
Noise	Noise Dose, TWA	Dose Badge Reader	RYG_F50635	7-May-24	7-May-25	12
Workplace	Acrylic Acid	Field Rotameter	RYG_F50199	2-Jul-24	2-Oct-24	3
Workplace	Acrylic Acid	Field Rotameter	RYG_F50199	2-Oct-24	2-Jan-25	3
Workplace	Acrylic Acid	HPLC	BKK_FL0036	16-Jan-24	16-Jan-25	12
Workplace	Total Dust	Field Rotameter	RYG_F50197	1-Jul-24	1-Oct-24	3
Workplace	Total Dust	Field Rotameter	RYG_F50195	2-Oct-24	2-Jan-25	3
Workplace	Total Dust	Analytical Balance 5 D.	RYG_EN0004	22-Feb-24	22-Feb-25	12
Workplace	Respirable Dust	Field Rotameter	RYG_F50197	1-Jul-24	1-Oct-24	3
Workplace	Respirable Dust	Field Rotameter	RYG_F50195	2-Oct-24	2-Jan-25	3
Workplace	Respirable Dust	Analytical Balance 5 D.	RYG_EN0004	22-Feb-24	22-Feb-25	12
Workplace	Propylene Glycol	Field Rotameter	RYG_F50653	2-Jul-24	2-Oct-24	3
Workplace	Propylene Glycol	Field Rotameter	RYG_F50655	2-Oct-24	2-Jan-25	3
Workplace	Propylene Glycol	GC-FID	BKK_EN0126	21-Apr-23	21-Oct-24	18
Workplace	Propylene Glycol	GC-FID	BKK_EN0126	22-Oct-24	22-Apr-26	18

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Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Rayong Lab	BOD	DO meter with Sensor	RYG_EN0032	24-Jul-23	24-Jan-25	18
Rayong Lab	BOD	Incubator	RYG_EN0154	1-Nov-24	1-May-26	18
Rayong Lab	BOD	Burette	RYG_EN0216	24-Sep-24	24-Sep-25	12
Rayong Lab	COD	Spectrophotometer	RYG_EN0037	18-Sep-23	18-Mar-25	18
Rayong Lab	Oil & Grease	Electronic Balance	RYG_EN0002	22-Feb-24	22-Feb-25	12
Rayong Lab	Oil & Grease	Hot Air Oven	RYG_EN0213	21-Mar-24	21-Mar-25	12
Rayong Lab	Oil & Grease	Water Bath	RYG_EN0061	21-Mar-24	21-Sep-25	18
Rayong Lab	pH on site	pH meter	RYG_F50594	30-Jul-24	29-Jul-25	12
Rayong Lab	Temperature	pH meter	RYG_F50695	30-Aug-24	30-Aug-25	12
Rayong Lab	Total Suspended Solids	Electronic Balance	RYG_EN0002	22-Feb-24	22-Feb-25	12
Rayong Lab	Total Suspended Solids	Chamber Oven	RYG_EN0010	21-Mar-24	21-Sep-25	18
Rayong Lab	Total Kjeldahl Nitrogen	Block Digestion Unit	RYG_EN0108	11-Mar-24	11-Sep-25	12
Rayong Lab	Total Kjeldahl Nitrogen	pH Meter	RYG_EN0183	19-Jan-24	19-Jul-25	18
Rayong Lab	Phosphate	Spectrophotometer	RYG_EN0037	18-Sep-23	18-Mar-25	18

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Lot No. 24136511-1

ANALYZER CALIBRATION DATA

Client : BASF (Thai) Limited Location : Boiler Stack
Date : 09 Dec 24 Test Operator : Saksit P.

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

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	0.05	0.02	0.12
Low-Level Gas	8.00	8.10	8.05	0.20
Span Gas	16.02	16.12	16.07	0.20

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

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.00	0.00
Low-Level Gas	82.39	82.49	82.41	0.04
Span Gas	164.40	164.50	164.42	0.04

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

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.04	0.02	0.01
Low-Level Gas	78.75	78.78	78.77	0.01
Span Gas	159.90	159.98	159.95	0.02

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

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.05	-0.01	0.01
Low-Level Gas	79.48	79.43	79.47	0.01
Span Gas	407.40	407.35	407.39	0.01

Calibrated by

Saksit P.

(Mr.Saksit Phaisanphisut)

Environmental Field Scientist (4)



Lot No. 24136511-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : BASF (Thai) Limited Location : Boiler Stack
Date : 09 Dec 24 Test Operator : Saksit P.

O₂ ANALYZER
Cylinder Conc. (%) : 16.02 Span (%) : 25

	O ₂ Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.05	0.05	0.00	0.02	0.12	0.12
Upscale Gas	16.12	16.12	0.00	16.07	0.20	0.20

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

	NO _x Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.00	0.00	0.00	0.00	0.00	0.00
Upscale Gas	164.50	164.50	0.00	164.42	0.04	0.04

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

	SO ₂ Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.04	0.04	0.00	0.02	0.01	0.01
Upscale Gas	159.98	159.98	0.00	159.95	0.02	0.02

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

	CO Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.05	-0.05	0.00	-0.01	0.01	0.01
Upscale Gas	407.35	407.35	0.00	407.39	0.01	0.01

Calibrated by

Saksit P.

(Mr.Saksit Phaisanphisut)

Environmental Field Scientist (4)



EMISSION TEST RESULT

Client		Run #	
BASF (Thai) Limited		1	
Date	09 Dec 24	Location	Boiler Stack
Start Time	12:55	Test Operator	Saksit P.
SO ₂ Analyzer Model	TELEDYNE API 100EH	Finish Time	13:15
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.	437
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.	774
		Serial No.	451

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	NO ₂ (ppm)
12:55	6.77	8.18	64.84	0.36	12.64	0.57
12:56	6.77	8.19	64.75	0.35	12.46	0.51
12:57	6.72	8.21	64.35	0.35	12.69	0.63
12:58	6.70	8.20	64.46	0.34	11.90	0.61
12:59	6.79	8.17	65.78	0.37	9.92	0.87
13:00	7.04	8.01	67.64	0.38	5.51	1.00
13:01	7.15	7.96	70.23	0.37	4.24	1.12
13:02	7.19	7.96	71.39	0.37	3.88	1.10
13:03	7.06	7.97	71.83	0.33	4.69	0.92
13:04	6.81	8.14	65.69	0.32	10.61	0.00
13:05	6.78	8.17	64.72	0.31	11.97	0.58
13:06	6.77	8.18	64.66	0.32	11.96	0.55
13:07	6.73	8.19	65.02	0.32	11.14	0.72
13:08	6.73	8.23	66.96	0.35	9.54	0.92
13:09	6.99	8.03	69.40	0.35	5.85	1.23
13:10	7.11	8.00	70.89	0.35	4.30	1.06
13:11	7.14	7.96	71.48	0.36	4.09	1.11
13:12	7.15	7.98	71.58	0.34	3.85	1.28
13:13	7.16	7.96	71.79	0.33	3.96	1.18
13:14	7.21	7.95	71.95	0.44	3.74	1.21
13:15	7.04	8.02	72.09	0.40	4.86	0.93
Average	6.94	8.07	68.17	0.35	7.79	0.87

Saksit P.

(Mr.Saksit Phaisanphisut)

Environmental Field Scientist (4)

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EMISSION TEST RESULT

Client		Run #	
BASF (Thai) Limited		2	
Date	09 Dec 24	Location	Boiler Stack
Start Time	13:16	Test Operator	Saksit P.
SO ₂ Analyzer Model	TELEDYNE API 100EH	Finish Time	13:36
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.	437
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.	774
		Serial No.	451

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	NO ₂ (ppm)
13:16	6.84	8.14	66.88	0.38	10.17	0.00
13:17	6.87	8.14	65.24	0.36	11.27	0.76
13:18	6.85	8.15	64.88	0.37	11.28	0.82
13:19	6.72	8.21	65.27	0.36	10.51	1.22
13:20	6.84	8.14	66.96	0.39	9.21	1.22
13:21	7.10	7.98	69.23	0.38	5.22	1.31
13:22	7.19	7.94	70.56	0.40	3.87	1.36
13:23	7.24	7.92	71.18	0.37	3.58	1.45
13:24	7.26	7.91	71.76	0.38	3.44	1.47
13:25	7.23	7.90	72.18	0.41	3.29	1.34
13:26	6.97	8.08	71.55	0.35	6.90	0.70
13:27	6.85	8.14	65.80	0.33	10.53	0.00
13:28	6.92	8.10	64.85	0.33	10.44	1.02
13:29	6.90	8.10	65.13	0.33	10.57	0.73
13:30	6.90	8.12	65.68	0.34	9.78	0.95
13:31	7.06	8.01	67.15	0.36	6.64	1.31
13:32	7.19	7.95	69.22	0.34	3.97	1.27
13:33	7.23	7.91	69.53	0.33	3.58	0.94
13:34	7.30	7.86	69.14	0.33	3.23	1.21
13:35	7.28	7.89	69.62	0.35	3.17	1.46
13:36	7.14	7.99	70.49	0.34	4.60	1.16
Average	7.04	8.02	68.21	0.36	6.92	1.03

Saksit P.

(Mr.Saksit Phaisanphisut)

Environmental Field Scientist (4)

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EMISSION TEST RESULT

Client		Run #	
BASF (Thai) Limited		3	
Date	09 Dec 24	Location	Boiler Stack
Start Time	13:37	Test Operator	Saksit P.
SO ₂ Analyzer Model	TELEDYNE API 100EH	Finish Time	13:57
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.	437
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.	774
		Serial No.	451

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	NO ₂ (ppm)
13:37	6.90	8.08	69.34	0.31	9.65	0.82
13:38	6.91	8.10	66.79	0.30	10.69	0.46
13:39	6.91	8.11	64.42	0.29	10.71	0.73
13:40	6.87	8.11	64.70	0.32	9.59	1.05
13:41	6.85	8.18	71.71	0.33	8.10	0.00
13:42	7.13	7.98	70.30	0.32	5.15	1.55
13:43	7.25	7.89	70.87	0.33	3.36	1.31
13:44	7.26	7.89	71.46	0.41	3.11	1.14
13:45	7.26	7.89	71.78	0.41	3.08	1.08
13:46	7.26	7.91	71.81	0.41	2.90	1.05
13:47	7.13	7.97	71.54	0.39	3.88	1.05
13:48	6.93	8.11	69.49	0.37	8.84	0.90
13:49	6.92	8.10	67.60	0.33	10.16	0.62
13:50	6.90	8.09	64.96	0.35	10.33	0.87
13:51	6.92	8.10	64.46	0.36	10.45	0.90
13:52	6.97	8.10	65.16	0.37	9.25	1.20
13:53	7.18	7.93	66.98	0.36	5.75	1.49
13:54	7.27	7.89	69.12	0.37	3.36	1.51
13:55	7.35	7.84	70.70	0.39	2.73	1.49
13:56	7.32	7.85	71.15	0.35	2.73	1.49
13:57	7.32	7.85	71.27	0.35	2.80	1.42
Average	7.08	7.99	68.84	0.35	6.51	1.05

Saksit P.

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Environmental Field Scientist (4)

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ANALYZER CALIBRATION DATA

Lot No. 24136517-1

Client	: BASF (Thai) Limited	Location	: Scrubber Stack
Date	: 09 Dec 24	Test Operator	: Saksit P.

O ₂ ANALYZER			
Model	: TELEDYNE API 200EH	Serial No.	: 774
Span (%)	: 25		

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	0.05	0.02	0.12
Low-Level Gas	8.00	8.10	8.05	0.20
Span Gas	16.02	16.12	16.07	0.20

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

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.07	0.01	0.03
Low-Level Gas	82.39	82.49	82.41	0.04
Span Gas	164.40	164.50	164.42	0.04

SO ₂ ANALYZER			
Model	: TELEDYNE API 100EH	Serial No.	: 437
Span (ppm)	: 200		

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.04	0.02	0.01
Low-Level Gas	78.75	78.78	78.77	0.01
Span Gas	159.90	159.98	159.95	0.02

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

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.05	-0.01	0.01
Low-Level Gas	79.48	79.43	79.47	0.01
Span Gas	407.40	407.35	407.39	0.01

Calibrated by

Saksit P.

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FORM NO.: F 06-062 REVISION NO.: 4 ISSUE DATE: 18/01/24

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Lot No. 24136517-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : BASF (Thai) Limited Location : Scrubber Stack
Date : 09 Dec 24 Test Operator : Saksit P.

O₂ ANALYZER : 16.02 Span (%) : 25
Cylinder Conc. (%)

	O ₂ Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.05	0.05	0.00	0.02	0.12	0.12
Upscale Gas	16.12	16.12	0.00	16.07	0.20	0.20

NO_x ANALYZER : 154.40 Span (ppm) : 200
Cylinder Conc. (ppm)

	NO _x Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.07	0.07	0.00	0.01	0.03	0.03
Upscale Gas	164.50	164.50	0.00	164.42	0.04	0.04

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

	SO ₂ Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.04	0.04	0.00	0.02	0.01	0.01
Upscale Gas	159.98	159.98	0.00	159.95	0.02	0.02

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

	CO Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.05	-0.05	0.00	-0.01	0.01	0.01
Upscale Gas	407.35	407.35	0.00	407.39	0.01	0.01

Calibrated by

(Mr.Saksit Phaisanphisut)

Environmental Field Scientist (4)

FORM NO.: F 06-063 REVISION NO.: 4 ISSUE DATE: 18/01/24

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EMISSION TEST RESULT

Client : BASF (Thai) Limited Run # : 1
Date : 09 Dec 24 Location : Scrubber Stack
Start Time : 10:55 Test Operator : Saksit P.
SO₂ Analyzer Model : TELEDYNE API 100EH Finish Time : 11:15
NO_x/O₂ Analyzer Model : TELEDYNE API 200EH Serial No. : 437
CO/CO₂ Analyzer Model : TELEDYNE API 300EM Serial No. : 774
Serial No. : 451

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	NO ₂ (ppm)
10:55	19.30	0.67	2.65	0.03	49.88	0.51
10:56	19.36	0.73	2.57	0.03	77.73	0.52
10:57	19.40	0.73	2.47	0.04	78.07	0.49
10:58	19.44	0.73	2.36	0.03	78.80	0.45
10:59	19.48	0.72	2.27	0.05	82.89	0.43
11:00	19.57	0.72	2.20	0.06	76.93	0.41
11:01	19.64	0.68	2.15	0.05	76.47	0.41
11:02	19.76	0.65	2.12	0.07	80.94	0.39
11:03	19.84	0.63	2.08	0.06	83.95	0.36
11:04	19.86	0.60	2.04	0.07	89.57	0.34
11:05	19.86	0.55	1.99	0.07	96.41	0.30
11:06	19.96	0.52	1.99	0.07	96.15	0.28
11:07	19.98	0.44	2.01	0.08	100.75	0.29
11:08	19.96	0.40	1.99	0.08	105.20	0.28
11:09	19.98	0.38	1.98	0.08	106.20	0.27
11:10	20.01	0.38	1.96	0.07	94.24	0.25
11:11	20.00	0.33	1.96	0.07	79.27	0.25
11:12	20.01	0.31	1.97	0.07	87.02	0.25
11:13	20.02	0.31	1.96	0.06	92.33	0.23
11:14	20.03	0.30	1.98	0.05	101.12	0.24
11:15	20.00	0.29	1.98	0.02	99.01	0.25
Average	19.78	0.52	2.13	0.06	87.28	0.34

(Mr.Saksit Phaisanphisut)

Environmental Field Scientist (4)

FORM NO.: F 06-060 REVISION NO.: 1 ISSUE DATE: 18/01/24

ALS Laboratory Group

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EMISSION TEST RESULT

Client : BASF (Thai) Limited Run # : 2
Date : 09 Dec 24 Location : Scrubber Stack
Start Time : 11:16 Test Operator : Saksit P.
SO₂ Analyzer Model : TELEDYNE API 100EH Finish Time : 11:36
NO_x/O₂ Analyzer Model : TELEDYNE API 200EH Serial No. : 437
CO/CO₂ Analyzer Model : TELEDYNE API 300EM Serial No. : 774
Serial No. : 451

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	NO ₂ (ppm)
11:16	20.00	0.29	2.00	0.02	82.88	0.27
11:17	20.02	0.29	2.01	0.05	86.75	0.27
11:18	20.00	0.28	2.01	0.05	87.19	0.28
11:19	19.99	0.28	2.01	0.05	86.03	0.27
11:20	20.00	0.29	2.01	0.06	94.54	0.27
11:21	19.99	0.29	2.01	0.04	97.14	0.27
11:22	19.99	0.28	2.01	0.04	96.64	0.27
11:23	20.02	0.29	2.00	0.03	100.16	0.26
11:24	20.07	0.29	2.00	0.04	102.65	0.24
11:25	20.08	0.29	2.02	0.04	98.08	0.25
11:26	20.08	0.29	2.04	0.05	94.29	0.26
11:27	20.09	0.29	2.05	0.05	92.43	0.27
11:28	20.06	0.28	2.03	0.05	84.21	0.27
11:29	20.07	0.24	2.03	0.06	78.91	0.26
11:30	20.08	0.24	2.04	0.03	77.42	0.25
11:31	20.06	0.23	2.04	0.03	79.52	0.25
11:32	20.07	0.23	2.06	0.03	78.42	0.26
11:33	20.07	0.24	2.06	0.04	88.11	0.27
11:34	20.05	0.24	2.06	0.03	76.67	0.26
11:35	20.05	0.24	2.07	0.04	74.35	0.27
11:36	20.07	0.24	2.07	0.05	73.01	0.28
Average	20.04	0.26	2.03	0.04	87.59	0.26

(Mr.Saksit Phaisanphisut)

Environmental Field Scientist (4)

FORM NO.: F 06-060 REVISION NO.: 1 ISSUE DATE: 18/01/24

ALS Laboratory Group

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EMISSION TEST RESULT

Client : BASF (Thai) Limited Run # : 3
Date : 09 Dec 24 Location : Scrubber Stack
Start Time : 11:37 Test Operator : Saksit P.
SO₂ Analyzer Model : TELEDYNE API 100EH Finish Time : 11:57
NO_x/O₂ Analyzer Model : TELEDYNE API 200EH Serial No. : 437
CO/CO₂ Analyzer Model : TELEDYNE API 300EM Serial No. : 774
Serial No. : 451

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	NO ₂ (ppm)
11:37	20.12	0.24	2.07	0.06	70.70	0.28
11:38	20.17	0.24	2.07	0.04	71.62	0.26
11:39	20.14	0.24	2.06	0.05	75.51	0.25
11:40	20.11	0.25	2.06	0.05	72.60	0.24
11:41	20.12	0.25	2.05	0.05	70.81	0.23
11:42	20.13	0.22	2.05	0.06	66.25	0.24
11:43	20.18	0.19	2.05	0.06	58.63	0.24
11:44	20.19	0.20	2.06	0.06	66.26	0.24
11:45	20.21	0.21	2.07	0.06	74.23	0.23
11:46	20.20	0.21	2.08	0.06	73.35	0.24
11:47	20.20	0.21	2.10	0.06	72.71	0.25
11:48	20.21	0.18	2.11	0.06	57.16	0.26
11:49	20.20	0.17	2.10	0.07	51.06	0.25
11:50	20.18	0.17	2.09	0.07	50.61	0.23
11:51	20.26	0.17	2.07	0.07	51.38	0.22
11:52	20.31	0.17	1.99	0.04	49.21	0.19
11:53	20.34	0.17	1.83	0.04	49.79	0.11
11:54	20.35	0.17	1.72	0.05	49.91	0.12
11:55	20.35	0.16	1.69	0.03	48.65	0.13
11:56	20.35	0.16	1.69	0.03	36.12	0.14
11:57	20.35	0.17	1.69	0.03	37.61	0.15
Average	20.23	0.19	1.99	0.05	59.72	0.21

(Mr.Saksit Phaisanphisut)

Environmental Field Scientist (4)

FORM NO.: F 06-060 REVISION NO.: 1 ISSUE DATE: 18/01/24

ALS Laboratory Group

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CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Customer: AIR LIQUIDE
(THAILAND) LTD
Part Number: E04N189E3HAD002
Cylinder Number: GN0027210
Laboratory: 124 - Plumsteadville - PA
PGVP Number: A12022
Gas Code: CO,NO,NOX,SO2,BALN
Reference Number: 160-402340013-1
Cylinder Volume: 247.2 CF
Cylinder Pressure: 2215 PSIG
Valve Outlet: 860
Certification Date: Feb 11, 2022
Expiration Date: Feb 11, 2023

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 800/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.
Do Not Use This Cylinder before 100 days, i.e. 0.7 megapascals.

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	80.00 PPM	82.39 PPM	G1	+/- 1.0% NIST Traceable	02/04/2022, 02/11/2022
CARBON MONOXIDE	80.00 PPM	79.48 PPM	G1	+/- 0.6% NIST Traceable	02/04/2022
NITRIC OXIDE	80.00 PPM	82.38 PPM	G1	+/- 1.0% NIST Traceable	02/04/2022, 02/11/2022
SULFUR DIOXIDE	80.00 PPM	76.75 PPM	G1	+/- 0.9% NIST Traceable	02/04/2022, 02/11/2022
NITROGEN	Balance				

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	09010212	KAL004777	98.49 PPM CARBON MONOXIDE/NITROGEN	+/- 0.5%	Oct 16, 2024
NTRM	30061015	CC733106	38.61 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%	Oct 06, 2025
NTRM	20061014	CC708944	95.61 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%	Oct 06, 2025
DMIS	12410869139	CC323707	4.997 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.8%	Sep 03, 2024
NTRM	11810418	KAL004613	98.6 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Jul 28, 2023

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet iS50 FTIR AUP2010245 CO	FTIR	Feb 03, 2022
Nicolet iS50 FTIR AUP2010245 NO	FTIR	Feb 10, 2022
Nicolet iS50 FTIR AUP2010245 NO2	FTIR	Jan 27, 2022
Nicolet iS50 FTIR AUP2010245 SO2	FTIR	Jan 28, 2022

Triad Data Available Upon Request

NOTES: Gross Weight: 45.5 Kg
Net Weight: 8.1 Kg



CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E04N189E3HAD002
Cylinder Number: ND62877
Laboratory: 124 - Riverton (SAP) - NJ
PGVP Number: B52018
Gas Code: CO,NO,NOX,SO2,BALN
Reference Number: 82-401257850-1
Cylinder Volume: 247.2 CF
Cylinder Pressure: 2215 PSIG
Valve Outlet: 660
Certification Date: Aug 07, 2018
Expiration Date: Aug 07, 2026

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 800/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.
Do Not Use This Cylinder before 100 days, i.e. 0.7 megapascals.

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	160.0 PPM	164.4 PPM	G1	+/- 1.1% NIST Traceable	07/29/2018, 08/07/2018
NITRIC OXIDE	160.0 PPM	164.4 PPM	G1	+/- 1.1% NIST Traceable	07/29/2018, 08/07/2018
SULFUR DIOXIDE	160.0 PPM	159.8 PPM	G1	+/- 1.1% NIST Traceable	07/29/2018, 08/07/2018
CARBON MONOXIDE	160.0 PPM	167.4 PPM	G1	+/- 1.1% NIST Traceable	07/29/2018
NITROGEN	Balance				

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	17092411	58007997	100.3 PPM NITRIC OXIDE/NITROGEN	+/- 0.2%	May 11, 2019
PRM	12308	5804110	28.96 PPM NITROGEN DIOXIDE/AIR	+/- 1.5%	Jun 02, 2017
GMS	7042010104	CC088411	8.101 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Jun 01, 2020
NTRM	11010414	KAL004792	99.6 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Jul 29, 2023
NTRM	15005332	CC481507	491.9 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	Jun 08, 2021

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 APW1100361 CO	FTIR	Jul 19, 2018
Nicolet 6700 APW1100361 NO	FTIR	Jul 12, 2018
Nicolet 6700 APW1100361 NO2	FTIR	Aug 03, 2018
Nicolet 6700 APW1100361 SO2	FTIR	Aug 02, 2018

Triad Data Available Upon Request

NOTES:
Net weight: 8107 grams
Gross weight: 47090 grams

This calibration std. has been certified in accordance with the May 2012 EPA Traceability Protocol, Document EPA-800/R-12/031. All testing processes and measurements conform to the requirements of ISO/IEC 17025 and to Airgas ISO 9001:2008 and relate only to items identified on this certificate. All values are certified to be NIST Traceable with total uncertainty as detailed under Analytical Uncertainty. This document shall not be reproduced in full without written approval of the issuer.



TESTING CERT No. 3052.05

Approved for Release

Page 1 of 82-401257850-1

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E02N182E3HAD000
Cylinder Number: ND60018
Laboratory: 124 - Riverton (SAP) - NJ
PGVP Number: B52017
Gas Code: O2,BALN
Reference Number: 82-401018725-1
Cylinder Volume: 248.4 CF
Cylinder Pressure: 2214 PSIG
Valve Outlet: 590
Certification Date: Oct 23, 2017
Expiration Date: Oct 23, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 800/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.
Do Not Use This Cylinder before 100 days, i.e. 0.7 megapascals.

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
OXYGEN	8.000 %	8.000 %	G1	+/- 0.4% NIST Traceable	10/22/2017
NITROGEN	Balance				

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRMplus	09060206	CT242337	9.951 % OXYGEN/NITROGEN	+/- 0.3%	Nov 08, 2018

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba MPA 510-O2-TVM041	Paramagnetic	Sep 25, 2017

Triad Data Available Upon Request

NOTES:
This calibration std. has been certified in accordance with the May 2012 EPA Traceability Protocol, Document EPA-800/R-12/031. All testing processes and measurements conform to the requirements of ISO/IEC 17025 and to Airgas ISO 9001:2008 and relate only to items identified on this certificate. All values are certified to be NIST Traceable with total uncertainty as detailed under Analytical Uncertainty. This document shall not be reproduced in full without written approval of the issuer.



TESTING CERT No. 2000.02

Approved for Release

Page 1 of 82-401018725-1

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Customer: AIR LIQUIDE
(THAILAND) LTD
Part Number: E02N184E3HAD001
Cylinder Number: GN0027197
Laboratory: 124 - Plumsteadville - PA
PGVP Number: A12022
Gas Code: O2,BALN
Reference Number: 160-402340010-1
Cylinder Volume: 249.8 CF
Cylinder Pressure: 2214 PSIG
Valve Outlet: 590
Certification Date: Feb 02, 2022
Expiration Date: Feb 02, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 800/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.
Do Not Use This Cylinder before 100 days, i.e. 0.7 megapascals.

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
OXYGEN	16.00 %	16.02 %	G1	+/- 0.4% NIST Traceable	02/02/2022
NITROGEN	Balance				

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	09010270	1505228	23.30 % OXYGEN/NITROGEN	+/- 0.4%	Jun 01, 2022

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SIEMENS OXYMAT 6 - N1-W5-851 - O2	PARAMAGNETIC	Jan 27, 2022

Triad Data Available Upon Request

NOTES: Gross Weight: 48.8 Kg
Net Weight: 8.2 Kg



Approved for Release

Page 1 of 160-402340010-1



Stopwatch Calibration Test Report

Calibration Date : 10 Jul 24 Next Cal. Date : 10 Jan 25
Barometric Pressure (mmHg) : 752.4 Temperature (°C) : 29.2
Relative Humidity (%) : 64.0

Reference Stopwatch Data

Stopwatch ID No. : RYG_FS0540
Model : F808
Serial No. : E18061
Calibration Date : 4 Jul 24
Certificate No. : E-2407022

Console Control Meter Data

Dry Gas Meter No. : RYG_FS0315
Model : XC-572-V
Serial No. : 1706091

Run No.	Time Actual (m:ss.ms)	Time Reading (m:ss)	Diff. (ms)	Diff. (min)
1	5:00:03	5:00	3	0.00005
2	5:00:08	5:00	8	0.00013
3	5:00:07	5:00	7	0.00012
4	5:00:08	5:00	8	0.00013
5	5:00:05	5:00	5	0.00008
6	5:00:06	5:00	6	0.00010
7	5:00:06	5:00	6	0.00010
8	5:00:07	5:00	7	0.00012
9	5:00:08	5:00	8	0.00013
10	5:00:07	5:00	7	0.00012
			Average	0.00011
			SD	0.00003

Calibrate by : Saksit Phaisanphiset

Mr. Saksit Phaisanphiset

RYG Field Service Scientist (4)

Approved by : Nattaporn Jengwareewong

Mr. Nattaporn Jengwareewong

RYG Field Service Specialist (1)



DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date : 10 Jul 24		Ambient Temperature (°C) : 29.2			
Calibration sheet No. : C-100724-RYG_FS0315		Relative Humidity (%) : 64			
Digital Temperature ID : RYG_FS0315		Reference Temperature ID RYG_FS0681			
Serial No. : 1706091		Serial No. : 201090014918			
Model : XC-572-V		Model : Digicon-CC-VT-MS			
		Next Calibrate : 13 Nov 24			
Location	Reference Temperature °C	Digital Temperature °C	Error °C	MPE	Pass / Fail
Stack	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
	100	101	1	±3	Pass
	150	151	1	±3	Pass
	200	200	0	±3	Pass
	250	250	0	±3	Pass
	300	301	1	±3	Pass
	500	501	1	±3	Pass
	100	102	2	±3	Pass
Probe	120	121	1	±3	Pass
	140	141	1	±3	Pass
	100	101	1	±3	Pass
Oven	120	120	0	±3	Pass
	140	141	1	±3	Pass
	100	101	1	±3	Pass
Filter	100	101	1	±3	Pass
	120	121	1	±3	Pass
	140	140	0	±3	Pass
Exit	0	0	0	±3	Pass
	10	10	0	±3	Pass
	20	20	0	±3	Pass
Meter	0	-1	-1	±3	Pass
	25	24	-1	±3	Pass
	50	49	-1	±3	Pass
AUX	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass

MPE : (Maximum permissible error of measurement) ค่าความผิดพลาดสูงสุดของการวัดที่อนุญาต

Calibrated by : Saksit Phaisanphiset

(Mr. Saksit Phaisanphiset)

RYG Field Service Scientist (4)

Approved by : Nattaporn Jengwareewong

(Mr. Nattaporn Jengwareewong)

RYG Field Service Specialist (1)

FORM NO.: F 06-027 REVISION NO.: 2 ISSUE DATE: 16/2/23



PROBE NOZZLE DIAMETER

CALIBRATION DATA SHEET

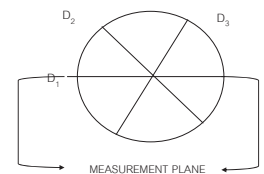
Calibration Date : 10 Jul 24				Nozzle Set ID. : RYG_FS0319	
Calibration Sheet No. : C-100724-RYG_FS0319				Vernier Caliper ID. : BKK_FS1123	
Nozzle ID #	Nozzle Diameter (cm.)			Hi - Lo	$(D_1 + D_2 + D_3) / 3$ D_{avg}
	D_1	D_2	D_3	ΔD	
1	0.298	0.300	0.305	0.007	0.301
2	0.465	0.475	0.465	0.010	0.468
3	0.605	0.605	0.605	0.000	0.605
4	0.770	0.760	0.765	0.010	0.765
5	0.930	0.928	0.930	0.002	0.929
6	1.082	1.080	1.085	0.005	1.082
7	1.240	1.230	1.235	0.010	1.235
8	1.594	1.558	1.551	0.043	1.568

Where :

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

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

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



Calibrated by : Saksit Phaisanphiset

(Mr. Saksit Phaisanphiset)

RYG Field Service Scientist (4)

Approved by : Nattaporn Jengwareewong

(Mr. Nattaporn Jengwareewong)

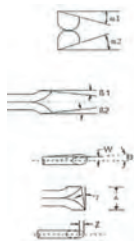
RYG Field Service Specialist (1)

FORM NO.: F 06-028 REVISION NO.: 2 ISSUE DATE: 16/2/23



Type S Pitot Tube Calibration

Date Calibration 10-Jul-24 Due Date 10-Jan-25
Pitot ID RYG_FS0321 Inclinator ID BKK_FS1131
Pitot SN - Vernier ID RYG_FS0539



Parameter	Value	Allowable Range	Check
$\alpha 1$	-1.4	$-10^\circ < \alpha 1 < +10^\circ$	OK
$\alpha 2$	-0.2	$-10^\circ < \alpha 2 < +10^\circ$	OK
$\beta 1$	0.8	$-5^\circ < \beta 1 < +5^\circ$	OK
$\beta 2$	-0.4	$-5^\circ < \beta 2 < +5^\circ$	OK
γ	0.8	-	-
θ	0.5	-	-
$Z = A \tan \gamma$	0.013	$Z \leq 0.125''$	OK
$W = A \tan \theta$	0.008	$W \leq 0.031''$	OK
Dt	0.310	0.188" to 0.375"	OK
A/2Dt	1.484	$1.05 \leq A/2Dt \leq 1.5$	OK
A	0.92	$2.1Dt \leq A \leq 3Dt$	OK

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

Calibrated by: Saksit Phaisanphut
(Mr. Saksit Phaisanphut)
RYG Field Services Scientist (1)

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

FORM NO.: F 06-124 REVISION NO.: 0 ISSUE DATE: 25/12/23



Calibration Certificate



Certificate No: G 670176
Date of issue: 08-Mar-24



Instrument description : Gas Analyzer
Instrument model : Testo 350 New
Control unit serial no. : 03401649/1119
Instrument serial no. : 62887344/1119
ID no. or control no. : RYG_FS0464
Manufacturer : Testo SE & Co. KGaA
Probe description : -
Probe model : -
Probe serial no. : -
Customer name : ALS LABORATORY GROUP (THAILAND) CO.,LTD.
Customer address : 104 Phatthanakan 40, Phatthanakan Road, Kiwaeng Phatthanakan, Khet Suan Luang, Bangkok, 10250 Thailand.

Total pages of certificate : 3 Pages
Receiving no. : L-240885
Receiving date. : 04-Mar-24
Parameter of calibration : Gas Calibration(Oxygen 2.50,10.04,21.02 %Vol, Carbon Monoxide 80.14,302,1003 ppm, Nitrogen Dioxide 30.34,81.32, 201.9 ppm, Nitric Oxide 30.01, 151.5, 322.5 ppm, Sulphur Dioxide 50.36, 100.8, 600.8 ppm)

Condition of UUC. : Used
Ambient condition : All of the Measurement were carried out the stabilized laboratory
Temperature : 23 $\pm$ 5 $^\circ$ C
Humidity : 55 $\pm$ 15 %RH

Calibration place : 17/121 Soi Ngamwongwan 47 Yaek 48, Toongsonghong, Lakki, Bangkok 10210

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

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

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

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

Date of calibration : 08-Mar-24

Kwancheek
Mr. Kwancheek Kiamdang
Calibration Technician

P. Wuttu
Mrs. Nongluck Wongtietee
Technical Manager

FM-CL-09-C Rev.0

Page 1 of 3

Issued Date 26/02/16

Entech Industrial Solution Co.,Ltd.

17, 121 Soi Ngamwongwan 47 Yaek 48, Toongsonghong, Lakki, Bangkok 10210 THAILAND Tel: 0-2779-8888 Calibration@entech.co.th
Tax ID : 010559035591 www.entech.co.th



Calibration Certificate



Certificate No.: G 670176

Standard References (Table 1)

Standard	Certificate No.	Vendor	Due date
Oxygen (O2) 2.50 % Vol	2412/23	Linde	27-Aug-27
Oxygen (O2) 10.04 % Vol	CG-0153-21	Hera	16-Nov-26
Oxygen (O2) 21.02 % Vol	CG-0041-22	Hera	10-Feb-27
Carbon monoxide (CO) 80.14 ppm	CG-0040-22	Hera	14-Feb-27
Carbon monoxide (CO) 302 ppm	1915/23	Linde	16-Jun-25
Carbon monoxide (CO) 1003 ppm	2584/23	Linde	10-Sep-25
Nitrogen Dioxide (NO2) 30.34 ppm	2703/22	Linde	22-Aug-24
Nitrogen Dioxide (NO2) 81.32 ppm	3546/23	Linde	14-Jan-26
Nitrogen Dioxide (NO2) 201.9 ppm	1975/23	Linde	17-Jul-25
Nitric Oxide (NO) 30.01 ppm	CG-0014-23	Hera	19-Feb-25
Nitric Oxide (NO) 151.5 ppm	0161/23	Linde	22-Jan-25
Nitric Oxide (NO) 322.5 ppm	1974/23	Linde	17-Jul-25
Sulphur Dioxide (SO2) 50.36 ppm	2004/23	Linde	17-Jul-25
Sulphur Dioxide (SO2) 100.8 ppm	3507/22	Linde	09-Nov-24
Sulphur Dioxide (SO2) 600.8 ppm	2003/23	Linde	17-Jul-25

Measured room conditions

Temperature : 23.6 $^\circ$ C Humidity : 65.2 %RH Pressure : 1011.2 mbar

Calibration conditions

Gas Temperature : 23 $^\circ$ C Flow rate : 1,300 ml/min Gas pressure : 1017.1 mbar

Calibration Results (Before adjustment) (Table 2)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (+)
O2 (%Vol)	2.50	2.45	-0.05	0.15
O2 (%Vol)	10.04	9.93	-0.11	0.20
O2 (%Vol)	21.02	21.10	0.08	0.30
CO (ppm)	80.14	81	0.86	3.0
CO (ppm)	302	305	3	6.0
CO (ppm)	1003	1009	6	12
NO2 (ppm)	30.34	24.2	-6.14	8.0
NO2 (ppm)	81.32	76.9	-4.42	8.0
NO2 (ppm)	201.9	188.7	-13.2	12
NO (ppm)	30.01	27	-3.01	8.0
NO (ppm)	151.5	144	-7.5	8.0
NO (ppm)	322.5	304	-18.5	12
SO2 (ppm)	50.36	50	-0.36	6.0
SO2 (ppm)	100.8	98	-2.8	6.0
SO2 (ppm)	600.8	597	-3.8	13

FM-CL-09-C Rev.0

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Issued Date 26/02/16

Entech Industrial Solution Co.,Ltd.

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Tax ID : 010559035591 www.entech.co.th



Calibration Certificate



Certificate No.: G 670176

Calibration Results (After adjustment) (Table 3)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (+)
O2 (%Vol)	2.500	2.45	-0.05	0.15
O2 (%Vol)	10.04	9.93	-0.11	0.20
O2 (%Vol)	21.02	21.10	0.08	0.30
CO (ppm)	80.14	81	0.86	3.0
CO (ppm)	302	305	3	6.0
CO (ppm)	1003	1009	6	12
NO2 (ppm)	30.34	29.5	-0.84	8.0
NO2 (ppm)	81.32	82.4	1.08	8.0
NO2 (ppm)	201.9	202.4	0.5	12
NO (ppm)	30.01	29	-1.01	8.0
NO (ppm)	151.5	152	0.5	8.0
NO (ppm)	322.5	321	-1.5	12
SO2 (ppm)	50.36	50	-0.36	6.0
SO2 (ppm)	100.8	98	-2.8	6.0
SO2 (ppm)	600.8	597	-3.8	13

Remark : 1 cmol/mol = 1 %Vol. 1 μ mol/mol = 1 ppm.

End of Report

FM-CL-09-C Rev.0

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Issued Date 26/02/16

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Tax ID : 010559035591 www.entech.co.th



ROTA METER CALIBRATION RESULT OCTOBER 2024

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
BKK_FS0573	02 Oct 24	Y = 1.0146x + 4.4306	1.0000
BKK_FS0577	02 Oct 24	Y = 1.1097x + 3.8082	0.9994
BKK_FS0584	02 Oct 24	Y = 1.0163x + 3.55	0.9997
BKK_FS0585	02 Oct 24	Y = 1.0324x + 2.63	0.9997
BKK_FS0587	02 Oct 24	Y = 1.029x + 1.25	0.9999
BKK_FS0591	02 Oct 24	Y = 1.0002x + 15.177	1.0000
BKK_FS0592	02 Oct 24	Y = 1.0003x + 15.506	1.0000
BKK_FS0594	02 Oct 24	Y = 1.0024x + 7.9314	1.0000
BKK_FS1006	02 Oct 24	Y = 1.0705x + 3.1952	1.0000
BKK_FS1007	02 Oct 24	Y = 1.0983x + 4.1833	0.9998
BKK_FS1008	02 Oct 24	Y = 1.1231x + 0.8782	0.9988
BKK_FS1017	02 Oct 24	Y = 1.0361x + 2.7864	0.9998
BKK_FS1018	02 Oct 24	Y = 1.0137x + 0.9333	1.0000
BKK_FS1019	02 Oct 24	Y = 1.0016x + 6.9648	1.0000
BKK_FS1026	02 Oct 24	Y = 1.1424x - 0.8571	0.9975
BKK_FS1027	02 Oct 24	Y = 1.0293x + 3.5233	1.0000
BKK_FS1028	02 Oct 24	Y = 1.0026x + 9.8067	1.0000
BKK_FS1039	02 Oct 24	Y = 1.0041x + 9.1033	0.9993
BKK_FS1040	02 Oct 24	Y = 1.0025x + 1.1619	1.0000
BKK_FS1041	02 Oct 24	Y = 1.0352x + 1.6626	1.0000
BKK_FS1042	02 Oct 24	Y = 1.0015x + 11.25	0.9995
BKK_FS1044	02 Oct 24	Y = 1.1163x + 0.7323	0.9973
PHK_FS0027	02 Oct 24	Y = 1.0849x + 3.3133	0.9991
PHK_FS0028	02 Oct 24	Y = 1.0257x + 1.5667	0.9999
PHK_FS0029	02 Oct 24	Y = 0.9989x + 14.706	1.0000
RYG_FS0195	02 Oct 24	Y = 1.0031x + 10.024	1.0000
RYG_FS0196	02 Oct 24	Y = 1.0047x + 8.6114	1.0000
RYG_FS0197	02 Oct 24	Y = 1.0049x + 10.074	1.0000
RYG_FS0198	02 Oct 24	Y = 1.0051x + 3.3883	1.0000
RYG_FS0199	02 Oct 24	Y = 1.0349x + 2.3983	0.9993
RYG_FS0627	02 Oct 24	Y = 1.0162x + 6.0933	0.9999
RYG_FS0628	02 Oct 24	Y = 1.0035x + 7.8667	0.9999
RYG_FS0654	02 Oct 24	Y = 1.0541x + 2.2446	0.9999
RYG_FS0655	02 Oct 24	Y = 0.9734x + 17.51	0.9997
RYG_FS0656	02 Oct 24	Y = 1.0034x + 8.661	0.9999
RYG_FS0657	02 Oct 24	Y = 1.0322x + 4.2303	0.9999
RYG_FS0658	02 Oct 24	Y = 0.9945x + 10.98	0.9996
RYG_FS0659	02 Oct 24	Y = 1.0022x + 9.2876	1.0000
SGK_FS0135	02 Oct 24	Y = 1.0203x + 3.7733	0.9999

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ALS Laboratory Group



ROTA METER CALIBRATION RESULT OCTOBER 2024

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
SGK_FS0136	02 Oct 24	Y = 1.0313x - 1.0933	0.9999
SGK_FS0138	02 Oct 24	Y = 1.0479x + 5.8214	1.0000
SGK_FS0139	02 Oct 24	Y = 1.0166x + 4.0367	0.9998
SGK_FS0140	02 Oct 24	Y = 1.0006x + 14.979	1.0000
SGK_FS0141	02 Oct 24	Y = 1.0846x + 3.8398	1.0000
SGK_FS0142	02 Oct 24	Y = 1.0211x + 2.0233	1.0000
SGK_FS0143	02 Oct 24	Y = 1.0042x + 6.461	1.0000

Review By :

(Mr. Wichan Choonharat)

Enviro Field Services Manager

Approved By :

(Mr. Sarayuth Jittrantoni)

Assistant General Manager

Page 2 of 2

ALS Laboratory Group



Certificate of Calibration

HPLC_U-3000 ID#690 (BKK_FL0034)

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

DGP-3600SD S/N : 8105093

WPS-3000TSL S/N : 8107446

TCC-3000SD S/N : 6006552

DAD-3000 S/N : 8107298

For

ALS Laboratory Group (Thailand) Co.,Ltd



Operator Signature: _____ Date: 16-17/Jan/2024

(Mr. Supanut Phunpatum)

Test Engineer

SARTORIUS

Accredited by

NSC-TISI-TIS 17025

Calibration 0426



Calibration certificate

Calibration Certificate No. 24BCI0440

Object	Electronic non-automatic weighing instrument	This calibration certificate documents the traceability to national standards.
Manufacturer	Sartorius	Uncertainties of measurements are taken into account when only statements of compliance are made.
Type	SECURA224-1S	This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP WI 08.
Serial QM Ident. no.	38304165 BKK_EN0309	This certificate relate and apply this equipment only.
Customer	ALS Laboratory Group (Thailand)Co., Ltd.	
Order no.	246928	
Number of pages	4	
Date of calibration	05 Nov 2024	

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

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

Date	05 Nov 2024	Approval of the Calibration Certificate	Person in charge
		Mr. Chonchai Inthana	Chonchai Inthana

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang
10310 BangkokVerical®
Version 6.5

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Calibration object

Single range instrument

Model	SECURA224-1S
Serial Number	38304165
QM Ident. no Inventory no.	BKK_EN0309 ---
Maximum capacity (Max. load)	220.0000 g
Measured range	220.0000 g
Scale interval	0.0001 g

Place of calibration

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

Calibration procedure

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

Test equipment

Test equipment type	Test equipment ID	Valid until
Thermometer	MHB-382SD s/nB011342 Traceable to SI unit through DKSH	21 Aug 2025
Test weight set OIML R111 E2	Certificate No.M2308197S_E2(Traceable to SI unit through TCS)	23 Aug 2025

Adjustment Status

The measuring device was internally adjusted before the calibration.

Environmental and measuring conditions

Date of calibration	05 Nov 2024
Temperature at place of calibration Temp. diff.	19.6 °C 0.4 K
Tw Weights - T Place	
Measuring conditions	The installation site is suitable. The device was levelled. Balance was loaded up to Max before test.
Comments	Humidity 68.0 %RH.

Measurement results | Measurement uncertainties

Repeatability				Eccentricity	
Test load (nominal): 10 g 100 g				Test load (nominal): 100 g	
	10 g	100 g			
1	10.0000 g	100.0000 g		Center	100.0000 g
2	10.0000 g	99.9999 g		Front left	100.0001 g
3	10.0001 g	100.0000 g		Back left	100.0000 g
4	10.0000 g	99.9999 g		Back right	100.0000 g
5	10.0000 g	100.0000 g		Front right	100.0000 g
6	9.9999 g	99.9999 g		Maximum deviation from centric loading indication	
7	10.0000 g	100.0000 g		Δlecc max = 0.0001 g	
8	9.9999 g	100.0000 g			
9	10.0000 g	99.9999 g			
10	10.0001 g	100.0000 g			
s = 0.00007 g			s = 0.00005 g		

Testload	Indication	Error	Expansion factor	Uncertainty	Uncertainty relative
<i>L</i>	<i>I</i>	<i>E</i>	<i>k</i>	<i>U(E)</i>	<i>U_{rel}(E)</i>
0.0100 g	0.0100 g	0.0000 g	2.00	0.00016 g	1.6 %
0.0500 g	0.0500 g	0.0000 g	2.00	0.00013 g	0.26 %
0.1000 g	0.1000 g	0.0000 g	2.00	0.00013 g	0.13 %
0.5000 g	0.5000 g	0.0000 g	2.00	0.00013 g	0.027 %
1.0000 g	1.0000 g	0.0000 g	2.00	0.00013 g	0.013 %
2.0000 g	2.0000 g	0.0000 g	2.00	0.00013 g	0.0067 %
5.0000 g	5.0000 g	0.0000 g	2.00	0.00014 g	0.0027 %
10.0000 g	10.0000 g	0.0000 g	2.00	0.00014 g	0.0014 %
20.0000 g	20.0000 g	0.0000 g	2.00	0.00014 g	0.00071 %
200.0000 g	199.9999 g	-0.0001 g	2.00	0.00028 g	0.00014 %
210.0000 g	210.0000 g	0.0000 g	2.00	0.00031 g	0.00015 %
Maximum error of indication		E _{max} = 0.0001 g			

U_{rel}(E) is the quotient of *U(E)* and test load *L*. The uncertainty of measurement *U(E)* is valid only if error *E* is considered. You will find reference notes on the uncertainty of measurement in use under: Appendix to the calibration certificate | Interpretation of measurement results.
Reference note: The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the documented Expansion factor, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

End of calibration certificate

Interpretation of measurement results | Appendix to the calibration certificate

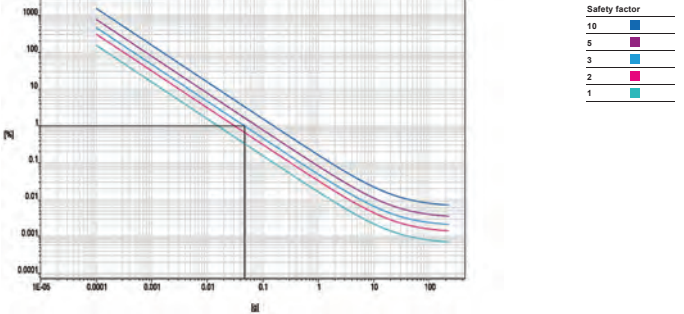
Uncertainty of measurement in use

Device adjusted before measurement	Yes
Temperature deviation considered	1 K (isoCAL active)
Temperature coefficient considered	2 · 10 ⁻⁴ /K
Uncertainty of the weighing result <i>U_g(W)</i>	<i>U_g(W)</i> = 0.00016 g + 6.42 · 10 ⁻⁶ · <i>R</i>

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

Indication in % from max load	Net indication	Uncertainty	Uncertainty relative
	<i>R</i>	<i>U_g(W)</i>	<i>U_g(W)_{rel}</i>
1 %	2.2000 g	0.00017 g	0.0079 %
25 %	55.0000 g	0.00051 g	0.00093 %
50 %	110.0000 g	0.00087 g	0.00079 %
75 %	165.0000 g	0.0012 g	0.00074 %
100 %	220.0000 g	0.0016 g	0.00071 %

Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example

Process accuracy	1.00 %
Safety factor	3
Minimum sample weight	0.0470 g

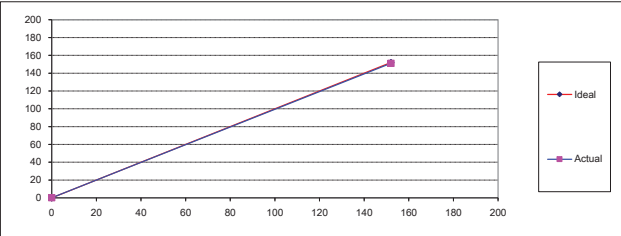


CALIBRATION REPORT

Calibration Date	1-Jul-24	Equipment ID	BKK_FS0758
Equipment Name	FID Analyzer	Manufacturer	Baseline Mocon
Model	9000H	Serial No.	0315EF0047
Std.Gas Conc.(ppm)	152	Cylinder No.	D878173
Certified Date	27-Jun-18	Expired Date	27-Jun-26

CALIBRATION RESULTS

Point	CALIBRATION RESULTS			
	Ideal	Actual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
SPAN	152.00	151.10	-0.90	-0.59
AVERAGE (%)				-0.25



Calibrated By

Approved By

(Mr.Apleit Sing-ha)

Field Environmental Scientist (4)

(Mr.Sarayuth Jitranont)

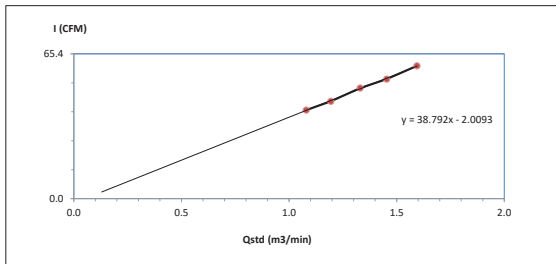
Assistant General Manager



High Volume Air Sampler Calibration Worksheet

Project Site :	BASF (Thai) Limited	Barometric Pressure (mm Hg) :	755.7
Calibrate Location :	ภายในคอมเพล็กซ์	Temperature (°C) :	31.0
Calibrate Date :	6-Dec-24	High Volume ID :	RYG_FS0664
Calibration Sheet No.:	C-061224-RYG_FS0664	High Volume Model :	TE-5009X
Calibrator ID:	RYG_FS0205	High Volume S/N :	6261
Calibrator Model :	TE-5028A	Calibrator Slope :	1.52567
Calibrator S/N :	1166	Calibrator Intercept :	-0.03613

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.6	1.0796	40	Slope : 38.7921 Intercept : -2.0093 Correlation Coefficient : 0.9991
2	3.2	1.1937	44	
3	4.0	1.3303	50	
4	4.8	1.4539	54	
5	5.8	1.5946	60	



Calibrated by : จตุรชัย
(Mr.Chatchai Sukpia)
RYG-Field Services Scientist(1)

Approved by : Spt S
(Mr. Supot Salamteh)
RYG-Field Services Section Head

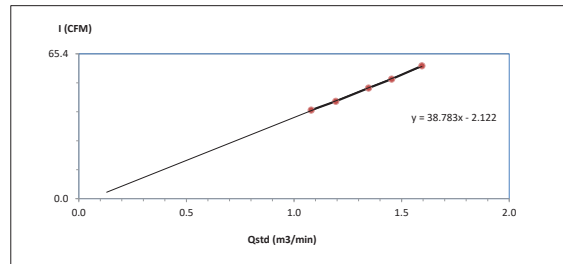
FORM NO.: F 06-073 REVISION NO.:2 ISSUE DATE: 20/11/23



High Volume Air Sampler Calibration Worksheet

Project Site :	BASF (Thai) Limited	Barometric Pressure (mm Hg) :	755.7
Calibrate Location :	บ้านพื้ง	Temperature (°C) :	31.0
Calibrate Date :	6-Dec-24	High Volume ID :	RYG_FS0661
Calibration Sheet No.:	C-061224-RYG_FS0661	High Volume Model :	TE-5009X
Calibrator ID:	RYG_FS0205	High Volume S/N :	6258
Calibrator Model :	TE-5028A	Calibrator Slope :	1.52567
Calibrator S/N :	1166	Calibrator Intercept :	-0.03613

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.6	1.0796	40	Slope : 38.7830 Intercept : -2.1220 Correlation Coefficient : 0.9995
2	3.2	1.1937	44	
3	4.1	1.3464	50	
4	4.8	1.4539	54	
5	5.8	1.5946	60	



Calibrated by : จตุรชัย
(Mr.Chatchai Sukpia)
RYG-Field Services Scientist(1)

Approved by : Spt S
(Mr. Supot Salamteh)
RYG-Field Services Section Head

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

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2843 8381-6, e-mail: service.thailand@sartorius.com



SARTORIUS

Certificate of Calibration

Model Number :	LA130S-F	Certificate No.:	24BCI0088
Description :	Analytical Balance	Issued Date :	Friday, February 23, 2024
Serial Number :	25409864	Reference No.:	229196
ID No.:	RYG_EN0001		
Manufacturer :	Sartorius	Page No.:	1 of 1

Customer Name : ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
618/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand

Calibrated Place : ALS Laboratory Group (Thailand) Co., Ltd. (Balance Room)
618/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Calibrated By : Mr.Chonchai Inthana
Calibration Date : Thursday, February 22, 2024

Metrological data :
Capacity : 150 g Readability : 0.0001 g
Temperature : 23.6 °C ± 5.0 °C
Humidity : 54.0 % RH ± 10.0 % RH
Pressure : ±

Reasons for calibration
☐ New Installation ☐ Service / Repair ☒ Re-calibration/ Maintenance
Equipment Condition: ☒ Good Operate ☐ Fail

Measurement Method UKAS Publication Ref :Lab 14
The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM). The calibration certificate documents the traceability to National Standards, which realize the Unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came from list of Sartorius Metrological Specifications.

Traceability:

Model Number	Description	Traceability	Certificate No.	Due Date
YCS011-522-00	Sartorius weight set 1mg - 3000g E2 YCS011-522-00	TCS	M2308197S	23-Aug-2025
MHB-382SD	Humidity/Barometer/Temp. Lutron MHB-382SD	DKSH	C19231845	23-Aug-2024

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

Mr.Chonchai Inthana(Technical Manager)



Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2843 8381-6 Fax: +66 2843-8387, e-mail: service.thailand@sartorius.com

SARTORIUS

Certificate of Calibration

Model Number :	LA130S-F	Certificate No.:	24BCI0088
Description :	Analytical Balance	Issued Date :	Friday, February 23, 2024
Serial Number :	25409864	Reference No.:	229196
ID No.:	RYG_EN0001		
Manufacturer :	Sartorius	Page No.:	2 of 2

Calibration Results : Without Adjustment

Repeatability	Eccentricity (Off-center loading error)
The reproducibility is the ability of a weighing instrument to display nearly identical results under constant test conditions when the same load within a measurement range is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express reproducibility quantitatively.	The off-center loading error is yielded by the difference between the readout of the load, i.e. 1/5 or 1/4 of maximum capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to GUM, R76).
Nominal Value : (Low Load) 10 g Tolerance 0.0001 g	Nominal value : 50 g Tolerance 0.0004 g
Nominal Value : (High Load) 100 g Tolerance 0.0001 g	
Standard Deviation 0.00005 0.00008	

Linearity

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

Tolerance 0.0002 g				
Nominal Value (g)	Conventional Mass Value (g)	Displayed Value (g)	Deviation (g)	Uncertainty (g)
0.01	0.0100	0.0100	0.0000	0.00020
0.05	0.0500	0.0500	0.0000	0.00021
0.1	0.1000	0.1000	0.0000	0.00021
0.5	0.5000	0.5000	0.0000	0.00021
1	1.0000	1.0000	0.0000	0.00021
2	2.0000	2.0000	0.0000	0.00021
5	5.0000	5.0000	0.0000	0.00021
10	10.0000	10.0001	0.0001	0.00024
20	20.0000	20.0001	0.0001	0.00021
100	100.0000	99.9999	-0.0001	0.00024

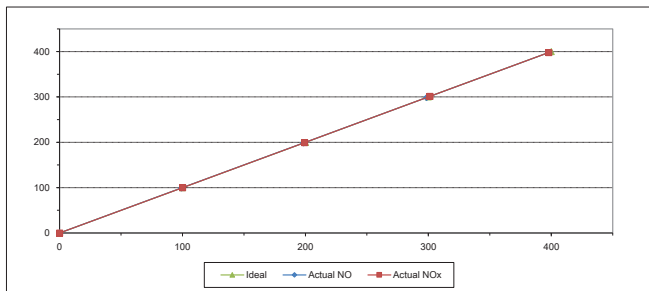
End of Report



MULTIPOINT CALIBRATION REPORT

Calibration Date	2-Jul-24	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	8G314J3K	Equipment ID	RYG_FS0264
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.05	0.05	0.05	0.10	0.10	0.10
1	100.00	99.20	-0.80	-0.80	100.10	0.10	0.10
2	200.00	198.50	-1.50	-0.75	199.30	-0.70	-0.35
3	300.00	298.60	-1.40	-0.47	301.40	1.40	0.47
4	400.00	398.20	-1.80	-0.45	398.00	-2.00	-0.50
AVERAGE (%)				-0.48			-0.04



Calibrated By

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

Approved By

(Mr. Sarayuth Jitranont)
Assistant General Manager

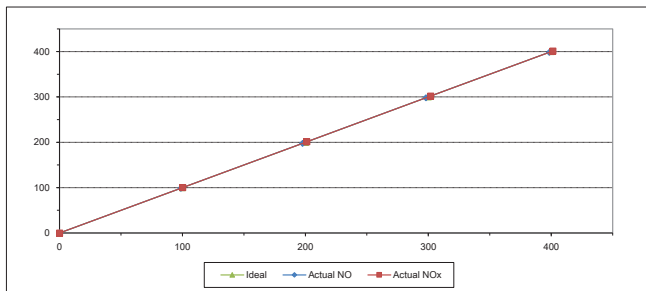
ALS Laboratory Group
FORM NO.: F 06-056 REVISION NO.: ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	2-Jul-24	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	SEEAW53E	Equipment ID	RYG_FS0261
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	98.70	-1.30	-1.30	100.20	0.20	0.20
2	200.00	197.70	-2.30	-1.15	201.20	1.20	0.60
3	300.00	298.10	-1.90	-0.63	302.00	2.00	0.67
4	400.00	398.50	-1.50	-0.38	401.40	1.40	0.35
AVERAGE (%)				-0.67			0.38



Calibrated By

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

Approved By

(Mr. Sarayuth Jitranont)
Assistant General Manager

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

SITHIPORN ASSOCIATES CO., LTD. CALIBRATION LABORATORY

45/45/1 Sirinthorn Road, Bangbunma, Bangkok, 10700 Thailand
Tel: +66 2433 8331 Email: calibration@sithiporn.com



Cert. No.: ACC24008
Pages: 1 of 3

Calibration Certificate

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

Condition As Found: GOOD

Customer: ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAEANG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

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

Received Date: 19 JANUARY 2024
Calibration Date: 26 JANUARY 2024
Date of Issue: 29 JANUARY 2024

Calibrated by: Natthakorn Pisutpaisan

Approved by:

(Thanakul Petchurai)

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45/45/1 Sirinthorn Road, Bangbunma, Bangkok, 10700 Thailand
Tel: +66 2433 8331 Email: calibration@sithiporn.com



Cert. No.: ACC24008
Job No.: VC67AC0058
Pages: 2 of 3

Calibration Procedure: CP-AC-03

Calibration Method:

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

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

Condition of this result of calibration:

1. Reference Standard Instruments:

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL_BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL_BP 30/0267	13-FEB-24
Digital Multimeter	33461A	MY60024273	EEL_BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAJ	34560495	AA-3002-23	14-FEB-24
Audio Analyzer	AVR-3360A	V744B6069	EF-0012-23	10-FEB-24

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

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

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

(Thanakul Petchurai)

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbunru, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiporn.com



Cert. No. : ACC24008
Job No. : VC67AC0058
Pages : 3 of 3

Result of calibration :

1. Sound pressure level

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

2. Frequency

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

3. Total distortion

Measured value (%)	Uncertainty (%)	Acceptance limit (%)
0.83	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

T. Petchur

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CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbunru, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiporn.com



Cert. No. : ACL24077
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-52A / Microphone UC-59 / Preamplifier NH-25
Serial No.: 00920831 / 22191 / 22220
ID No.: RYG_FS0622

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

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

Received Date : 11 JANUARY 2024
Calibration Date : 22-24 JANUARY 2024
Date of Issue : 24 JANUARY 2024



Calibrated by : Nathakorn Pisutpaisan

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

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CALIBRATION LABORATORY

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Tel. +66 2433 8331 Email : calibration@sithiporn.com



Cert. No. : ACL24077
Job No. : VC67AC0054
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY532302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL-BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL-BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL-BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :

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

T. Petchur

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CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbunru, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiporn.com



Cert. No. : ACL24077
Job No. : VC67AC0054
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long-term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

T. Petchur

Cert. No. : ACL24077
Job No. : VC67AC0054
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	94.0	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
13.8

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

Frequency Weighting	Measured value (dB)
A - weight	8.7
C - weight	13.7
Flat	19.6

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.2	0.2	± 1.0
1000	0.2	0.2	0.2	± 0.7
8000	0.4	0.5	0.5	+ 1.5, - 2.5

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Job No. : VC67AC0054
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	±1.0
125	0.1	0.1	0.0	±1.0
250	0.0	0.0	0.0	±1.0
500	0.0	0.0	0.0	±1.0
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	+ 1.5, - 2.5
16000	0.0	-1.2	-1.2	+ 2.5, -16.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.1

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Cert. No. : ACL24077
Job No. : VC67AC0054
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	±0.8
136.0	136.0	0.0	±0.8
135.0	135.0	0.0	±0.8
134.0	134.0	0.0	±0.8
133.0	133.0	0.0	±0.8
132.0	132.0	0.0	±0.8
131.0	131.0	0.0	±0.8
129.0	129.0	0.0	±0.8
124.0	124.0	0.0	±0.8
119.0	119.0	0.0	±0.8
114.0	114.0	0.0	±0.8
109.0	109.0	0.0	±0.8
104.0	104.0	0.0	±0.8
99.0	99.0	0.0	±0.8
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	53.9	-0.1	±0.8
49.0	49.0	0.0	±0.8
44.0	44.0	0.0	±0.8
39.0	38.9	-0.1	±0.8
34.0	33.9	-0.1	±0.8
30.0	29.9	-0.1	±0.8
29.0	28.9	-0.1	±0.8
28.0	27.9	-0.1	±0.8
27.0	26.9	-0.1	±0.8
26.0	25.9	-0.1	±0.8
25.0	24.9	-0.1	±0.8

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Cert. No. : ACL24077
Job No. : VC67AC0054
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	±0.8

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.0 ; -3.0
	2	8	117.0	117.0	0.0	1.0 ; -1.5
	200	800	134.0	134.1	0.1	±0.5
Slow	2	8	108.0	108.0	0.0	1.0 ; -3.0
	200	800	127.6	127.6	0.0	±0.5
SEL	0.25	1	99.0	98.9	-0.1	1.0 ; -3.0
	2	8	108.0	108.0	0.0	1.0 ; -1.5
	200	800	128.0	128.0	0.0	±0.5

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	±2.0
One	136.4	135.4	-1.0	±2.0

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	±1.0
Positive half cycle	135.4	135.2	-0.2	±1.0
Negative half cycle	135.4	135.2	-0.2	±1.0

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Cert. No. : ACL24077
Job No. : VC67AC0054
Pages : 8 of 8

11. Overload indication

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

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.1

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

End of Calibration Certificate

T. Petchurai

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY

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Tel: +66 2433 8331 Email: calibration@sithiporn.com



Cert. No. : ACL24083
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-52A / Microphone UC-59 / Preamplifier NH-25
Serial No.: 01120938 / 21888 / 22327
ID No.: RYG_FS0629

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

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

Received Date : 11 JANUARY 2024
Calibration Date : 22-24 JANUARY 2024
Date of Issue : 24 JANUARY 2024



Calibrated by : Nathakorn Pisutpaisan

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

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Cert. No. : ACL24083
Job No. : VC67AC0054
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL.BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KA1	34560495	AA-3002-23	14-FEB-24

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

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

3.1 National Institute of Metrology (Thailand).

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

T. Petchurai

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Cert. No. : ACL24083
Job No. : VC67AC0054
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

T. Petchurai

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	94.0	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.4

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	14.5
Flat	20.2

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.1	0.1	± 1.0
1000	0.2	0.2	0.2	± 0.7
8000	0.7	0.8	0.8	+ 1.5, - 2.5

T. Petch

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	±1.0
125	0.0	0.0	0.0	±1.0
250	0.0	0.0	-0.1	±1.0
500	0.0	0.0	-0.1	±1.0
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	+ 1.5, - 2.5
16000	0.0	-1.2	-1.2	+ 2.5, -16.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.1

T. Petch

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	±0.8
136.0	136.0	0.0	±0.8
135.0	135.0	0.0	±0.8
134.0	134.0	0.0	±0.8
133.0	133.0	0.0	±0.8
132.0	132.0	0.0	±0.8
131.0	131.0	0.0	±0.8
129.0	129.0	0.0	±0.8
124.0	124.0	0.0	±0.8
119.0	119.0	0.0	±0.8
114.0	114.0	0.0	±0.8
109.0	109.0	0.0	±0.8
104.0	104.0	0.0	±0.8
99.0	99.0	0.0	±0.8
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.0	0.0	±0.8
44.0	44.0	0.0	±0.8
39.0	39.0	0.0	±0.8
34.0	34.0	0.0	±0.8
30.0	30.0	0.0	±0.8
29.0	29.0	0.0	±0.8
28.0	28.0	0.0	±0.8
27.0	27.0	0.0	±0.8
26.0	26.0	0.0	±0.8
25.0	25.0	0.0	±0.8

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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	±0.8

9. Tone burst response

Time: Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.0 ; -3.0
	2	8	117.0	117.0	0.0	1.0 ; -1.5
	200	800	134.0	134.0	0.0	±0.5
Slow	2	8	108.0	108.0	0.0	1.0 ; -3.0
	200	800	127.6	127.6	0.0	±0.5
SEL	0.25	1	99.0	98.9	-0.1	1.0 ; -3.0
	2	8	108.0	108.0	0.0	1.0 ; -1.5
	200	800	128.0	128.0	0.0	±0.5

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	±2.0
One	136.4	136.3	-0.1	±2.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	132.9	-0.1	±1.0
Positive half cycle	135.4	135.1	-0.3	±1.0
Negative half cycle	135.4	135.1	-0.3	±1.0

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11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.7	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	±0.1

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

End of Calibration Certificate

T. Petchurai

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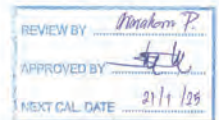
Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-52A / Microphone UC-59 / Preamplifier NH-25
Serial No. : 01120936 / 21737 / 22325
ID No. : RYG_FS0627

Condition As Found : GOOD

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

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %
Received Date : 11 JANUARY 2024
Calibration Date : 22-24 JANUARY 2024
Date of Issue : 24 JANUARY 2024



Calibrated by : Nathakorn Pisutpaisan

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

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

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Cert. No. : ACL24081
Job No. : VC67AC0054
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Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL-BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL-BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL-BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :

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

T. Petchurai

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Cert. No. : ACL24081
Job No. : VC67AC0054
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Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long-term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

T. Petchurai

Cert. No. : ACL24081
Job No. : VC67AC0054
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	94.0	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
13.4

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

Frequency Weighting	Measured value (dB)
A - weight	8.7
C - weight	13.7
Flat	19.3

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.2	0.3	0.3	± 1.0
1000	0.2	0.2	0.2	± 0.7
8000	0.4	0.5	0.5	+ 1.5, - 2.5

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Cert. No. : ACL24081
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4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.1	±1.0
125	0.1	0.1	0.0	±1.0
250	0.1	0.0	0.0	±1.0
500	0.1	0.1	0.0	±1.0
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	±1.0
4000	0.0	0.0	0.0	±1.0
8000	0.0	0.1	0.1	+ 1.5, - 2.5
16000	0.0	-1.2	-1.1	+ 2.5, -16.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

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Job No. : VC67AC0054
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	±0.8
136.0	136.0	0.0	±0.8
135.0	135.1	0.1	±0.8
134.0	134.0	0.0	±0.8
133.0	133.0	0.0	±0.8
132.0	132.0	0.0	±0.8
131.0	131.0	0.0	±0.8
129.0	129.0	0.0	±0.8
124.0	124.0	0.0	±0.8
119.0	119.0	0.0	±0.8
114.0	114.0	0.0	±0.8
109.0	109.0	0.0	±0.8
104.0	104.0	0.0	±0.8
99.0	99.0	0.0	±0.8
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.0	0.0	±0.8
44.0	44.0	0.0	±0.8
39.0	39.0	0.0	±0.8
34.0	34.0	0.0	±0.8
30.0	29.9	-0.1	±0.8
29.0	28.9	-0.1	±0.8
28.0	27.9	-0.1	±0.8
27.0	26.9	-0.1	±0.8
26.0	26.0	0.0	±0.8
25.0	24.9	-0.1	±0.8

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Job No. : VC67AC0054
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	±0.8

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.0 ; -3.0
	2	8	117.0	116.9	-0.1	1.0 ; -1.5
	200	800	134.0	134.0	0.0	±0.5
Slow	2	8	108.0	107.9	-0.1	1.0 ; -3.0
	200	800	127.6	127.5	-0.1	±0.5
SEL	0.25	1	99.0	98.8	-0.2	1.0 ; -3.0
	2	8	108.0	107.9	-0.1	1.0 ; -1.5
	200	800	128.0	128.0	0.0	±0.5

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
One	136.4	136.1	-0.3	±2.0

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	±1.0
Positive half cycle	135.4	135.1	-0.3	±1.0
Negative half cycle	135.4	135.1	-0.3	±1.0

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Cert. No. : ACL24081
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11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.5	0.0	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.1

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

End of Calibration Certificate

T. Petchurai

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Cert. No. : ACL24082
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Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-52A / Microphone UC-59 / Preamplifier NH-25
Serial No. : 01120937 / 21845 / 22326
ID No. : RYG_FS0628

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWANG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

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

Received Date : 11 JANUARY 2024
Calibration Date : 22-24 JANUARY 2024
Date of Issue : 24 JANUARY 2024

Calibrated by : Nathakorn Pisutpaisan

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

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

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Cert. No. : ACL24082
Job No. : VC67AC0054
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL_BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL_BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL_BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KA1	34560495	AA-3002-23	14-FEB-24

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

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

3.1 National Institute of Metrology (Thailand).

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

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Cert. No. : ACL24082
Job No. : VC67AC0054
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

T. Petchurai

Cert. No. : ACL24082
Job No. : VC67AC0054
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	94.0	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.2

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

Frequency Weighting	Measured value (dB)
A - weight	9.9
C - weight	14.3
Flat	19.9

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.2	0.2	0.2	± 1.0
1000	0.2	0.2	0.2	± 0.7
8000	0.4	0.5	0.5	+ 1.5, - 2.5

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Cert. No. : ACL24082
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4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	±1.0
125	0.0	0.1	0.1	±1.0
250	0.0	0.0	0.0	±1.0
500	0.0	0.1	0.0	±1.0
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	±1.0
4000	0.0	0.0	0.0	±1.0
8000	0.0	0.1	0.1	+ 1.5, - 2.5
16000	0.0	-1.2	-1.1	+ 2.5, -16.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long-term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.1

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Cert. No. : ACL24082
Job No. : VC67AC0054
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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	137.1	0.1	±0.8
136.0	136.0	0.0	±0.8
135.0	135.1	0.1	±0.8
134.0	134.0	0.0	±0.8
133.0	133.0	0.0	±0.8
132.0	132.0	0.0	±0.8
131.0	131.0	0.0	±0.8
129.0	129.0	0.0	±0.8
124.0	124.0	0.0	±0.8
119.0	119.0	0.0	±0.8
114.0	114.0	0.0	±0.8
109.0	109.0	0.0	±0.8
104.0	104.0	0.0	±0.8
99.0	99.0	0.0	±0.8
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.0	0.0	±0.8
44.0	44.0	0.0	±0.8
39.0	39.0	0.0	±0.8
34.0	34.0	0.0	±0.8
30.0	30.0	0.0	±0.8
29.0	28.9	-0.1	±0.8
28.0	28.0	0.0	±0.8
27.0	26.9	-0.1	±0.8
26.0	25.9	-0.1	±0.8
25.0	24.9	-0.1	±0.8

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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	±0.8

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	108.0	0.0	1.0 ; -3.0
	2	8	117.0	117.0	0.0	1.0 ; -1.5
	200	800	134.0	134.1	0.1	±0.5
Slow	2	8	108.0	108.0	0.0	1.0 ; -3.0
	200	800	127.6	127.6	0.0	±0.5
SEL	0.25	1	99.0	98.9	-0.1	1.0 ; -3.0
	2	8	108.0	108.0	0.0	1.0 ; -1.5
	200	800	128.0	128.1	0.1	±0.5

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	±2.0
One	136.4	136.4	0.0	±2.0

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	±1.0
Positive half cycle	135.4	135.1	-0.3	±1.0
Negative half cycle	135.4	135.1	-0.3	±1.0

T. Petch

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11. Overload indication

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

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.1

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

End of Calibration Certificate

T. Petchumai

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Cert. No. : ACL24075
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 01222716 / 143832 / 22763
ID No.: RYG_FS0020

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

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

Received Date : 11 JANUARY 2024
Calibration Date : 22-24 JANUARY 2024
Date of Issue : 24 JANUARY 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by :

T. Petchumai
(Thamkul Petchumai)

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.

T. Petchumai

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Cert. No. : ACL24075
Job No. : VC67AC0054
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL-BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL-BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL-BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KA1	34560495	AA-3002-23	14-FEB-24

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

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

3.1 National Institute of Metrology (Thailand).

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

T. Petchumai

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Cert. No. : ACL24075
Job No. : VC67AC0054
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	-	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

Cert. No. : ACL24075
Job No. : VC67AC0054
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Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.4

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	23.6

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.5	0.5	0.5	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	-0.7	-0.6	-0.6	±5.0

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4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

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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	135.0	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	53.9	-0.1	± 1.1
49.0	49.0	0.0	± 1.1
44.0	43.9	-0.1	± 1.1
39.0	38.9	-0.1	± 1.1
34.0	33.9	-0.1	± 1.1
30.0	29.9	-0.1	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	26.9	-0.1	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

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Cert. No. : ACL24075
Job No. : VC67AC0054
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	135.3	-1.1	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

T. Retan

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11. Overload indication

Measured value (dB)		Deviated. Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.7	89.5	-0.2	±1.5

12. High level stability

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

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

End of Calibration Certificate

T. Petchur

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Cert. No. : ACL24091
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00233184 / 144837 / 23232
ID No.: RYG_FS0025

Condition As Found : GOOD

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

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

Received Date : 19 JANUARY 2024
Calibration Date : 25-26 JANUARY 2024
Date of Issue : 29 JANUARY 2024

Calibrated by : Nathakorn Pisutpaisan

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

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other than in full, except with the prior written approval of the head of Calibration Laboratory.

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Cert. No. : ACL24091
Job No. : VC67AC0058
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL_BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL_BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL_BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KA1	34560495	AA-3002-23	14-FEB-24

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :

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

T. Petchur

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Cert. No. : ACL24091
Job No. : VC67AC0058
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	-	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

T. Petchur

Cert. No. : ACL24091
Job No. : VC67AC0058
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.6

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

Frequency Weighting	Measured value (dB)
A - weight	10.8
C - weight	17.3
Flat	23.0

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	-0.3	-0.3	-0.3	±5.0

T. Petch

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Job No. : VC67AC0058
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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	0.0	0.0	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	-0.1	±1.5
500	0.0	0.0	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

T. Petch

Cert. No. : ACL24091
Job No. : VC67AC0058
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	132.9	-0.1	± 1.1
132.0	131.9	-0.1	± 1.1
131.0	130.9	-0.1	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.1	0.1	± 1.1
27.0	27.0	0.0	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.1	0.1	± 1.1

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8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.1	0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	135.6	-0.8	±3.0

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

T. Petch

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbunru, Bangkok, 10700 Thailand
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Cert. No. : ACL24091
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11. Overload indication

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

12. High level stability

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

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

End of Calibration Certificate

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CALIBRATION LABORATORY

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Cert. No. : ACL24092
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Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No. : 00734220 / 145286 / 34371
ID No. : RYG_FS0026

Condition As Found : GOOD

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

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

Received Date : 19 JANUARY 2024
Calibration Date : 25-26 JANUARY 2024
Date of Issue : 29 JANUARY 2024

Calibrated by : Nathakorn Pisutpaisan

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

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.

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Cert. No. : ACL24092
Job No. : VC67AC0058
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL-BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL-BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL-BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :

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

T. Petchur

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbunru, Bangkok, 10700 Thailand
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Cert. No. : ACL24092
Job No. : VC67AC0058
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	-	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

T. Petchur

Cert. No. : ACL24092
Job No. : VC67AC0058
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
16.3

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

Frequency Weighting (Hz)	Measured value (dB)
A - weight	13.4
C - weight	19.5
Flat	25.4

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	±1.5
1000	0.1	0.1	0.1	±1.0
8000	2.3	2.3	2.3	±5.0

7. Peter

Cert. No. : ACL24092
Job No. : VC67AC0058
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

7. Peter

Cert. No. : ACL24092
Job No. : VC67AC0058
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±1.1
136.0	136.0	0.0	±1.1
135.0	135.0	0.0	±1.1
134.0	134.0	0.0	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.0	0.0	±1.1
114.0	114.0	0.0	±1.1
109.0	109.0	0.0	±1.1
104.0	104.0	0.0	±1.1
99.0	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
30.0	29.9	-0.1	±1.1
29.0	29.0	0.0	±1.1
28.0	28.0	0.0	±1.1
27.0	27.1	0.1	±1.1
26.0	26.1	0.1	±1.1
25.0	25.1	0.1	±1.1

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Cert. No. : ACL24092
Job No. : VC67AC0058
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	135.6	-0.8	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

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Cert. No. : ACL24092
Job No. : VC67AC0058
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11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.7	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

7. Petchur

Cert. No. : ACL23324
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42/ Microphone UC-52 / Preamplifier NH-24
Serial No. : 00873109 / 171842 / 73485
ID No. : RYG_PS0384

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

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

Received Date : 11 OCTOBER 2023
Calibration Date : 19-20 OCTOBER 2023
Date of Issue : 24 OCTOBER 2023

REVIEWED BY: *Nathakorn P.*
APPROVED BY: *7. Petchur*
NEXT CAL. DATE: 19/10/24

Calibrated by : Nathakorn Pisutpaisan

Approved by : *7. Petchur*
(Thanakul Petchurai)

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other than in full, except with the prior written approval of the head of Calibration Laboratory.

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL23324
Job No. : VC67AC0011
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL.BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

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

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

3.1 National Institute of Metrology (Thailand).

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

QF-TS12-04-04-020664

7. Petchur

Continuation of Calibration Certificate

Cert. No. : ACL23324
Job No. : VC67AC0011
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings				
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings				
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For > 4 kHz to 10 kHz	✓	-	0.3	0.7
For > 10 kHz to 20 kHz	-	-	-	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long - term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Tone burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

Note : Pass/Fail evaluation for each parameter,
will be considered together from the acceptance limit and the Maximum-permitted uncertainty of measurement.

QF-TS12-04-04-020664

7. Petchur

Continuation of Calibration Certificate

Cert. No. : ACL23324
Job No. : VC67AC0011
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
16.8

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

Frequency Weighting	Measured value (dB)
A - weight	11.3
C - weight	17.5
Flat	23.1

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.4	0.4	0.5	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	-1.2	-1.1	-1.1	±5.0

QF-TS12-04-04-020664

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Continuation of Calibration Certificate

Cert. No. : ACL23324
Job No. : VC67AC0011
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	0.0	-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	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

QF-TS12-04-04-020664

T. Petch

Continuation of Calibration Certificate

Cert. No. : ACL23324
Job No. : VC67AC0011
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	53.9	-0.1	± 1.1
49.0	49.0	0.0	± 1.1
44.0	43.9	-0.1	± 1.1
39.0	38.9	-0.1	± 1.1
34.0	34.0	0.0	± 1.1
30.0	29.9	-0.1	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	26.9	-0.1	± 1.1
26.0	25.8	-0.2	± 1.1
25.0	24.9	-0.1	± 1.1

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Continuation of Calibration Certificate

Cert. No. : ACL23324
Job No. : VC67AC0011
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighing	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

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

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

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Continuation of Calibration Certificate

Cert. No. : ACL23324
Job No. : VC67AC0011
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.7	89.6	-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

QF-TS12-04-04-020664

T. Petchurai

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



Cert. No. : ACL23325
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42/ Microphone UC-52 / Preamplifier NH-24
Serial No.: 01073423 / 169513 / 73684
ID No.: RYG_FS0386

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %
Received Date : 11 OCTOBER 2023
Calibration Date : 19-20 OCTOBER 2023
Date of Issue : 24 OCTOBER 2023

Calibrated by : Nathakorn Pisutpaisan
Approved by : T. Petchurai
(Thanakul Petchurai)

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

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL23325
Job No. : VC67AC0011
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL_BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL_BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL_BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAJ	34560495	AA-3002-23	14-FEB-24

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

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

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

QF-TS12-04-04-020664

T. Petchurai

Continuation of Calibration Certificate

Cert. No. : ACL23325
Job No. : VC67AC0011
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings				
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings				
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For > 4 kHz to 10 kHz	✓	-	0.3	0.7
For > 10 kHz to 20 kHz	-	-	-	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long - term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Tone burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

Note : Pass/Fail evaluation for each parameter, will be considered together from the acceptance limit and the Maximum-permitted uncertainty of measurement.

QF-TS12-04-04-020664

T. Petchurai

Continuation of Calibration Certificate

Cert. No. : ACL23325
Job No. : VC67AC0011
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
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	13.1
C - weight	18.8
Flat	24.6

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.2	0.2	0.2	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	1.6	1.7	1.6	±5.0

QF-TS12-04-04-020664

P.T.M.

Continuation of Calibration Certificate

Cert. No. : ACL23325
Job No. : VC67AC0011
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

QF-TS12-04-04-020664

P.T.M.

Continuation of Calibration Certificate

Cert. No. : ACL23325
Job No. : VC67AC0011
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	53.9	-0.1	± 1.1
49.0	49.0	0.0	± 1.1
44.0	43.9	-0.1	± 1.1
39.0	38.9	-0.1	± 1.1
34.0	33.9	-0.1	± 1.1
30.0	29.9	-0.1	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	26.9	-0.1	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.8	-0.2	± 1.1

QF-TS12-04-04-020664

P.T.M.

Continuation of Calibration Certificate

Cert. No. : ACL23325
Job No. : VC67AC0011
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
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	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

QF-TS12-04-04-020664

P.T.M.

Continuation of Calibration Certificate

Cert. No. : ACL23325
Job No. : VC67AC0011
Pages : 8 of 8

11. Overload indication

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

12. High level stability

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

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

End of Calibration Certificate

QP-TS12-04-04-020664

451-451/1 Srinthorn Road, Bangbunru, Bangkok, 10700 Thailand
Tel: +66 2433 8331 Email: calibration@sithiporn.com

Cert. No. : ACL24007
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No. : 01173609 / 172170 / 74021
ID No. : RYG_FS0388

Condition As Found : GOOD

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

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

Received Date : 19 DECEMBER 2023
Calibration Date : 05-08 JANUARY 2024
Date of Issue : 09 JANUARY 2024

Calibrated by : Nathakorn Pisutpaisan

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

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

451-451/1 Srinthorn Road, Bangbunru, Bangkok, 10700 Thailand
Tel: +66 2433 8331 Email: calibration@sithiporn.com

Cert. No. : ACL24007
Job No. : VC67AC0044
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL-BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL-BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL-BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

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

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

3.1 National Institute of Metrology (Thailand).

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

451-451/1 Srinthorn Road, Bangbunru, Bangkok, 10700 Thailand
Tel: +66 2433 8331 Email: calibration@sithiporn.com

Cert. No. : ACL24007
Job No. : VC67AC0044
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	-	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

Cert. No. : ACL24007
Job No. : VC67AC0044
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test:

Measured Value (dB)
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	13.4
C - weight	19.9
Flat	25.3

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	0.8	0.9	0.9	±5.0

T. Petin

Cert. No. : ACL24007
Job No. : VC67AC0044
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

T. Petin

Cert. No. : ACL24007
Job No. : VC67AC0044
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.1	0.1	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.1	0.1	± 1.1

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Cert. No. : ACL24007
Job No. : VC67AC0044
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lcpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
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	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

T. Petin

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY

453-451/1 Srinthorn Road, Bangbunru, Bangkok, 10700 Thailand
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Cert. No. : ACL24007
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11. Overload indication

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

12. High level stability

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

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

End of Calibration Certificate



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-67/0292

MTC No. EEL. BP. 83/0267

CALIBRATION CERTIFICATE

Submitted by : ALS Laboratory Group (Thailand) Co., Ltd.
Address : 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok, 10250.
Calibrated at : Electrical and Electronic Standards Laboratory, Industrial Metrology and Testing Service Centre.
Sri 1C, Bangpoo Industrial Estate, Sukhumvit Rd., Muang, Samutprakan 10280.
Instrument Calibrated :
Description : Sound Calibrator
Manufacturer : Rion
Model : NC-74
Serial No. : 34178121 (ID:RYG_FS0213)
Standards used : 1. Digital Function Synthesizer NF Electronic DF-193A S/N 122037.
2. Measuring Amplifier Bruel&Kjaer 2636 S/N 1537484.
3. Programmable Attenuator Tanagawa TPA-303A S/N OF 2214.
4. Digital Multimeter Agilent 34401A S/N MY44005560.
5. Pressure Transmitter Vaisala PTB202AD S/N T0650001.
6. Audio Analyzer Keithley 2015-P S/N4106495.
7. Condenser Microphone B&K 4180 S/N 2889871.

Calibration Procedure: CP-102-04 based on IEC 60942-2003; The sound pressure level generated by sound calibrator under test shall be measured by standard microphone using an insert voltage technique.

This instrument has been calibrated against standards maintained at Electrical and Electronic Standards Laboratory (EEL), which are traceable to the International System of Units through the National Institute of Metrology (Thailand).

The information on actual reading is attached herewith and the uncertainty limits quoted refer to the measured values only.

Date of Receipt : 19 Feb. 2024

Date of Calibration : 28 Feb. 2024

The results relate only to the items tested/calibrated or value assigned.
Advertising the Report/Certificate and publicity of the results except in full are prohibited unless written permission is obtained from the governor of TISTR.

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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-67/0292

MTC No. EEL. BP. 83/0267

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

Nominal Output of Unit Under Test = 94 dB re 20µPa at 1000 Hz

Acoustic Output in dB re 20µPa, Corrected to Reference Conditions: 101.325 kPa, 23.0 °C and 50 %RH.

1. Sound Pressure Level

Standard Microphone Type	Measured Sound Pressure Level (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer 4180	94.01	0.01	± 0.10	±0.40 dB

2. Frequency

Standard Microphone Type	Measured Frequency (Hz)	Deviated value (Hz)	Uncertainty (Hz)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer 4180	1003.1	3.1	± 1.5	±1.0%

3. Total Distortion

Standard Microphone Type	Measured Total Distortion (%)	Uncertainty (%)	Tolerance limit IEC60942:2003 Class 1
1/2 inch Bruel&Kjaer 4180	1.80	± 0.50	±3.0%

Note : 1. No adjustment.

2. The calibrator pressure correction was not included.

3. The microphone volume correction was included at level of 0.16 dB from manual.

Calibrated by : (Mr. Weerachai Deechaiyao)

Approved by : (Mr. Pravithe Klunypa)
Director
Electrical and Electronic Standards Laboratory
Industrial Metrology and Testing Service Centre

Date of Calibration : 28 Feb. 2024

Date of Issue : 29 Feb. 2024

Ref : 2011267021900719001

End of Certificate

2 / 2

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SITHIPORN ASSOCIATES CO., LTD.
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Cert. No. : ACL24282

Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No. : 01122567 / 143473 / 22605
ID No. : RYG_FS0016

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWANG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

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

Received Date : 04 SEPTEMBER 2024
Calibration Date : 19 SEPTEMBER 2024
Date of Issue : 20 SEPTEMBER 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : (Thanakul Petchurai)



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

Cert. No. : ACL24282
Job No. : VC67AC0148
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).

The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL-BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL-BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL-BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

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

T. Petch

Cert. No. : ACL24282
Job No. : VC67AC0148
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

T. Petch

Cert. No. : ACL24282
Job No. : VC67AC0148
Page : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.4

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

Frequency Weighting	Weighting (dB)
A - weight	12.0
C - weight	18.4
Flat	24.1

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.1	0.1	± 1.5
1000	-0.1	-0.1	-0.1	± 1.0
8000	-2.4	-2.4	-2.4	± 5.0

T. Petch

Cert. No. : ACL24282
Job No. : VC67AC0148
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	-0.1	-0.1	±1.5
250	-0.1	0.0	-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	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

T. Petch

Cert. No. : ACL24282
Job No. : VC67AC0148
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	136.1	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	129.0	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	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
30.0	30.0	0.0	±1.1
29.0	28.9	-0.1	±1.1
28.0	28.0	0.0	±1.1
27.0	27.0	0.0	±1.1
26.0	26.0	0.0	±1.1
25.0	24.8	-0.2	±1.1

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Cert. No. : ACL24282
Job No. : VC67AC0148
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	30.0	29.9	-0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	116.9	-0.1	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.8	-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

T. Petch.

Cert. No. : ACL24282
Job No. : VC67AC0148
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	136.0	-0.4	±3.0

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

11. Overload indication

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

12. High level stability

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

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

End of Calibration Certificate

T. Petch.

Cert. No. : ACL24072
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER.
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 01122578 / 143842 / 22771
ID No.: RYG_FS0017

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

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

Received Date : 11 JANUARY 2024
Calibration Date : 22-24 JANUARY 2024
Date of Issue : 24 JANUARY 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petch.
(Thanakul Petchurai)

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SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY

461-461/1 Sirinthorn Road, Bangbunmu, Bangplud, Bangkok, 10700 Thailand
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Cert. No. : ACL24072
Job No. : VC67AC0054
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).

The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anchoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL_BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL_BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL_BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

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

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

3.1 National Institute of Metrology (Thailand).

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

7. Reten

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Cert. No. : ACL24072
Job No. : VC67AC0054
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	-	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

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Cert. No. : ACL24072
Job No. : VC67AC0054
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
16.7

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)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.4	0.4	0.5	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	0.0	0.1	0.1	±5.0

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Cert. No. : ACL24072
Job No. : VC67AC0054
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

7. Reten

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Cert. No. : ACL24072
Job No. : VC67AC0054
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.1	0.1	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.1	0.1	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	28.9	-0.1	± 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

T. Petchur

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Cert. No. : ACL24072
Job No. : VC67AC0054
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	108.0	0.0	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	135.3	-1.1	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	132.9	-0.1	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

T. Petchur

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Cert. No. : ACL24072
Job No. : VC67AC0054
Pages : 8 of 8

11. Overload indication

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

12. High level stability

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

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

End of Calibration Certificate

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Cert. No. : ACL24074
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 01122607 / 145554 / 34373
ID No.: RYG_FS0019

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

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

Received Date : 11 JANUARY 2024
Calibration Date : 22-24 JANUARY 2024
Date of Issue : 24 JANUARY 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petchur
(Thamakul Petchurai)

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

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Cert. No. : ACL24074
Job No. : VC67AC0054
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL-BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL-BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL-BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

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

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

3.1 National Institute of Metrology (Thailand).

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

7. Peter

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Cert. No. : ACL24074
Job No. : VC67AC0054
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	-	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

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Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
17.0

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

Frequency Weighting	Measured value (dB)
A - weight	10.8
C - weight	17.0
Flat	22.7

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.4	0.4	0.4	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	-1.4	-1.4	-1.3	±5.0

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Cert. No. : ACL24074
Job No. : VC67AC0054
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

7. Peter

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Cert. No. : ACL24074
Job No. : VC67AC0054
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
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

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Cert. No. : ACL24074
Job No. : VC67AC0054
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8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	± 1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	108.0	0.0	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	± 1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	± 1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	± 1.0

10. Peak C-sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	± 3.0
One	136.4	135.7	-0.7	± 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	± 2.0
Positive half cycle	135.4	135.2	-0.2	± 2.0
Negative half cycle	135.4	135.2	-0.2	± 2.0

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Cert. No. : ACL24074
Job No. : VC67AC0054
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.5	0.0	± 1.5

12. High level stability

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

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

End of Calibration Certificate

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Cert. No. : ACL24071
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 01222724 / 143486 / 22620
ID No.: RYG_FS0023

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

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

Received Date : 11 JANUARY 2024
Calibration Date : 22-24 JANUARY 2024
Date of Issue : 24 JANUARY 2024

Calibrated by : Nathakorn Pisutpaisan

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

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Cert. No. : ACL24071
Job No. : VC67AC0054
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).

The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL-BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL-BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL-BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

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

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

3.1 National Institute of Metrology (Thailand).

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

T. Petch

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Cert. No. : ACL24071
Job No. : VC67AC0054
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	-	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

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Cert. No. : ACL24071
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Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
17.3

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

Frequency Weighting	Measured value (dB)
A - weight	14.8
C - weight	20.6
Flat	26.4

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.0	0.0	0.0	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	1.4	1.5	1.5	±5.0

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Job No. : VC67AC0054
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	0.0	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	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

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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	53.9	-0.1	±1.1
49.0	48.9	-0.1	±1.1
44.0	43.9	-0.1	±1.1
39.0	38.9	-0.1	±1.1
34.0	33.9	-0.1	±1.1
30.0	29.9	-0.1	±1.1
29.0	28.9	-0.1	±1.1
28.0	27.9	-0.1	±1.1
27.0	26.9	-0.1	±1.1
26.0	25.8	-0.2	±1.1
25.0	24.9	-0.1	±1.1

T. Petchur

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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	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	135.9	-0.5	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

T. Petchur

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY

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Tel. +66 2433 8331 Email: calibration@sithiporn.com



Cert. No. : ACL24071
Job No. : VC67AC0054
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.7	89.5	-0.2	±1.5

12. High level stability

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

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

End of Calibration Certificate

T. Petchur

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Cert. No. : ACL24090
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00233183 / 144835 / 23230
ID No.: RYG_FS0024

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

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

Received Date : 19 JANUARY 2024
Calibration Date : 25-26 JANUARY 2024
Date of Issue : 29 JANUARY 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petchur
(Thanakul Petchurai)

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

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Cert. No. : ACL24090
Job No. : VC67AC0058
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EELBP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EELBP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EELBP 31/0266	14-FEB-24
Programmable Attenuator	MA1-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KA1	34560495	AA-3002-23	14-FEB-24

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

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

3.1 National Institute of Metrology (Thailand).

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

7. Peter

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Cert. No. : ACL24090
Job No. : VC67AC0058
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	-	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

7. Peter

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Cert. No. : ACL24090
Job No. : VC67AC0058
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.98)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
18.3

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

Frequency Weighting	Measured value (dB)
A - weight	14.2
C - weight	20.0
Flat	25.6

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			Acceptance Limits
	Flat	C-weight	A-weight	
125	0.2	0.2	0.2	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	0.3	0.3	0.3	± 5.0

7. Peter

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Cert. No. : ACL24090
Job No. : VC67AC0058
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

7. Peter

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CALIBRATION LABORATORY

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Cert. No. : ACL24090
Job No. : VC67AC0058
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	0.1	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.1	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.1	±1.1
30.0	30.0	0.1	±1.1
29.0	29.2	0.2	±1.1
28.0	28.3	0.3	±1.1
27.0	27.3	0.3	±1.1
26.0	26.4	0.4	±1.1
25.0	25.4	0.4	±1.1

G. Petch

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Cert. No. : ACL24090
Job No. : VC67AC0058
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	135.7	-0.7	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

G. Petch

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Cert. No. : ACL24090
Job No. : VC67AC0058
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.5	0.0	±1.5

12. High level stability

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

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

End of Calibration Certificate

G. Petch

CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 07 May 2024

CERTIFICATE NUMBER 213804

REVIEWED BY: *Margaret P*
APPROVED BY: *[Signature]*
NEXT CAL DATE: 7/1/25

Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2
Approved signatory
M. Berry
Electronically signed:
M. BERRY

Sound Calibrator : IEC 60942:2017

Instrument information

Manufacturer: Cirrus Research plc
Model: CR-516
Serial number: 100249
Class: 2

Notes:

Test summary

Date of calibration: 07 May 2024

The sound calibrator detailed above has been calibrated to the published data as described in the operating manual and in the half-inch configuration. The procedures and techniques used are as described in IEC60942_2017 Annex B – Periodic Tests and three determinations of the sound pressure level, frequency and total distortion were made.

The sound pressure level was measured using a WS2F condenser microphone type MK224 manufactured by Cirrus Research plc.

The results have been corrected to the reference pressure of 101.33 kPa using the manufacturer's data.

The sound calibrator has been shown to conform to the Class 2 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed.

However, as public evidence was not available, from a testing organisation responsible for pattern approval, to demonstrate that the model of sound calibrator conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2017, no general statement or conclusion can be made about conformance of the sound calibrator to the requirements of IEC 60942:2017.

Notes:

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%.

CERTIFICATE OF CALIBRATION

Certificate Number:
213804
Page 2 of 2

Environmental conditions

The following conditions were recorded at the time of the test:

Pressure: 101.76 kPa
Temperature: 21.7 °C
Humidity: 45.5 %

Test equipment

Equipment	Manufacturer	Model	Serial number
Distortion Meter	Keithley	2015	0839263
Acoustic Calibrator	Brüel and Kjær	4231	2610257
Environmental Monitor	Comet	T7510	21952628

Results

	Expected	Sample 1	Sample 2	Sample 3	Average	Deviation	Acceptance limit	Uncertainty
Level (dB)	94.00	93.98	93.98	94.00	93.99	-0.01	±0.40	0.11 dB
Distortion (%)	< 4.00	0.24	0.35	0.64	0.41	0.41	+3.00	0.13 %
Frequency (Hz)	1000.0	1000.0	1000.6	999.8	1000.1	0.1	±1.7	0.1 Hz
Level (dB)	114.00	113.89	113.90	113.90	113.90	-0.10	±0.40	0.11 dB
Distortion (%)	< 4.00	1.01	1.01	0.94	0.98	0.98	+3.00	0.13 %
Frequency (Hz)	1000.0	1000.3	1000.3	1000.3	1000.3	0.3	±1.7	0.1 Hz

End of results



ROTA METER CALIBRATION RESULT JULY 2024

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
BKK_FS0577	01 Jul 24	Y = 1.0001x + 0.0433	1.0000
BKK_FS0584	01 Jul 24	Y = 1.0056x - 2.7974	1.0000
BKK_FS0585	02 Jul 24	Y = 1.0315x + 3.0033	0.9998
BKK_FS0587	02 Jul 24	Y = 1.0294x + 0.71	1.0000
BKK_FS0588	01 Jul 24	Y = 0.9751x + 9.8452	0.9999
BKK_FS0591	01 Jul 24	Y = 1.0035x - 8.2303	1.0000
BKK_FS0592	02 Jul 24	Y = 1.002x + 14.273	1.0000
BKK_FS0594	02 Jul 24	Y = 1.0003x + 7.0095	1.0000
BKK_FS0595	01 Jul 24	Y = 1.0871x - 114.97	0.9985
BKK_FS1004	02 Jul 24	Y = 0.9826x + 13.51	0.9999
BKK_FS1005	02 Jul 24	Y = 1.0217x - 0.5833	0.9997
BKK_FS1006	02 Jul 24	Y = 1.149x - 1.0422	0.9981
BKK_FS1007	02 Jul 24	Y = 1.1116x + 3.3558	0.9994
BKK_FS1008	02 Jul 24	Y = 1.1273x + 0.4837	0.9999
BKK_FS1009	01 Jul 24	Y = 1.1044x - 0.8245	1.0000
BKK_FS1017	02 Jul 24	Y = 1.0488x + 2.2027	0.9998
BKK_FS1018	02 Jul 24	Y = 1.0173x - 0.1967	0.9999
BKK_FS1019	02 Jul 24	Y = 1.0022x + 5.619	1.0000
BKK_FS1026	01 Jul 24	Y = 1.072x - 2.4954	1.0000
BKK_FS1027	01 Jul 24	Y = 1.0104x - 4.4788	0.9999
BKK_FS1028	01 Jul 24	Y = 1.0009x - 3.7755	1.0000
BKK_FS1029	01 Jul 24	Y = 1.1118x - 4.4431	0.9965
BKK_FS1030	01 Jul 24	Y = 1.0159x - 6.395	1.0000
BKK_FS1031	01 Jul 24	Y = 0.9973x - 5.3371	0.9999
BKK_FS1039	02 Jul 24	Y = 0.9992x + 9.6833	0.9992
BKK_FS1040	01 Jul 24	Y = 1.0034x - 2.5343	1.0000
BKK_FS1041	02 Jul 24	Y = 1.0511x + 1.1272	0.9996
BKK_FS1042	02 Jul 24	Y = 1.0016x + 10.387	0.9995
BKK_FS1043	01 Jul 24	Y = 0.9965x + 9.3743	1.0000
BKK_FS1044	02 Jul 24	Y = 1.1237x - 0.4231	0.9981
BKK_FS1200	01 Jul 24	Y = 1.0337x - 0.1016	0.9994
BKK_FS1201	01 Jul 24	Y = 0.9871x + 5.0931	0.9986
BKK_FS1202	01 Jul 24	Y = 0.7978x + 301.39	0.9334
PHK_FS0027	02 Jul 24	Y = 1.0722x + 3.4395	0.9988
PHK_FS0028	02 Jul 24	Y = 1.0254x + 1.04	1.0000
PHK_FS0029	02 Jul 24	Y = 0.999x + 12.73	1.0000
RYG_FS0197	01 Jul 24	Y = 1.0045x + 10.291	1.0000
RYG_FS0198	01 Jul 24	Y = 1.0056x + 1.8883	1.0000
RYG_FS0199	02 Jul 24	Y = 1.0029x + 3.2381	0.9990

Page 1 of 2

ALS Laboratory Group



ROTA METER CALIBRATION RESULT JULY 2024

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
RYG_FS0654	02 Jul 24	Y = 1.0421x + 1.4935	1.0000
RYG_FS0655	02 Jul 24	Y = 0.975x + 15.2	0.9994
RYG_FS0656	01 Jul 24	Y = 1.0042x + 7.1067	0.9999
RYG_FS0657	02 Jul 24	Y = 1.0337x + 1.8918	0.9998
RYG_FS0658	02 Jul 24	Y = 0.9921x + 10.87	0.9996
RYG_FS0659	01 Jul 24	Y = 1.0022x + 8.4152	1.0000
SGK_FS0135	02 Jul 24	Y = 1.0193x + 3.6833	0.9999
SGK_FS0136	02 Jul 24	Y = 1.0217x + 1.63	1.0000
SGK_FS0138	02 Jul 24	Y = 1.055x + 4.5833	0.9999
SGK_FS0139	02 Jul 24	Y = 1.0154x + 3.74	0.9998
SGK_FS0140	02 Jul 24	Y = 1.0008x + 13.353	1.0000
SGK_FS0141	02 Jul 24	Y = 1.1185x + 1.4867	0.9998
SGK_FS0142	02 Jul 24	Y = 1.0211x + 1.39	1.0000
SGK_FS0143	02 Jul 24	Y = 1.0045x + 5.6981	1.0000

Review By : Wichan Choonharat
(Mr. Wichan Choonharat)
Enviro Field Services Manager

Approved By : Mr. Sarayuth Jitranont
(Mr. Sarayuth Jitranont)
Assistant General Manager

Sartorius (Thailand) Co., Ltd.
123 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8301-6, e-mail: service.thailand@sartorius.com



MSC 105-115 17023
CALIBRATION 0426

SARTORIUS

Certificate of Calibration

REVIEW BY : Thumthit
APPROVED BY : Dok
NEXT CAL DATE : 01/10/2025

Model Number : MSE125P-100-QU
Description : Semi-micro Balance
Serial Number : 0033108993
ID No. : RYG_EN0004
Manufacturer : Sartorius
Certificate No. : 24BC0071
Issued Date : Friday, February 23, 2024
Reference No. : 229195
Page No. : 1 of 3

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

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

Calibrated By : Mr. Chonchai Inthana
Calibration Date : Thursday, February 22, 2024
Calibration Procedure No. : This calibration was conducted by
Using in-house calibration procedure number (WH-003)
Based on UKAS LAB 14 : 2019

Metrological data :
Capacity : 60 /120 g Readability : 0.00001/0.0001 g
Temperature : 24.0 °C ± 5.0 °C
Humidity : 60.0 % RH ± 10.0 % RH
Pressure : ±
Reasons for calibration
☐ New Installation ☐ Service / Repair ☒ Recalibration / Maintenance
Equipment Condition : ☒ Good Operation ☐ For

Measurement Method UKAS Publication Ref : Lab 14
The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to the Expression of Uncertainty in Measurement (GUM). The calibration certificate documents the traceability to National Standards, which realize the unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came from list of Sartorius Metrological Specifications.

Model Number	Description	Traceability	Certificate No.	Due Date
YCS011-522-00	Sartorius weight set 1mg - 5000g E2,YCS011-522-00	TCS	M2308197S	23-Aug-2025
MHB-382SD	Humidity/Barometer/Temp. Lutron MHB-382SD	DKSH	C19231845	23-Aug-2024

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

Mr. Chonchai Inthana (Technical Manager)



SOP FM 33 03 February 2022

Certificate of Calibration

Model Number : MSE125P-100-DU Certificate No. : 24BC10071
Description : Semi-micro Balance Issued Date : Friday, February 23, 2024
Serial Number : 0033108993 Reference No. : 229196
ID No. : RYG_EN0004
Manufacturer : Sartorius Page No. : 2 of 3

Calibration Results : Without Adjustment

Repeatability		Eccentricity (Off-center loading error)	
The repeatability is the ability of a weighing instrument to display nearly identical readouts under constant test conditions when the same load within a measurement range is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express reproducibility quantitatively.		The off-center loading error is yielded by the difference between the readout of the load, i.e. 1/3 or 1/4 of maximum capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to GIM, R76).	
Nominal Value : (Low Load)	5.00003	50.00003	
5 g	5.00001	50.00003	
Tolerance	5.00003	50.00002	
0.000015 g	5.00002	50.00003	
	5.00001	50.00003	
Nominal Value : (High Load)	5.00002	50.00003	
50 g	5.00001	50.00003	
Tolerance	5.00001	50.00002	
0.000015 g	5.00002	50.00003	
	5.00002	50.00003	
Standard Deviation	0.000008	0.000005	

Linearity				
The linearity, also called linearity error, describes the deviation of the characteristic curve of a weighing instrument from the linear slope.				
Tolerance	0.00004 g			
Nominal Value (g)	Conventional Mass Value (g)	Displayed Value (g)	Deviation (g)	Uncertainty (g)
0.01	0.01000	0.01000	0.00000	0.000024
0.1	0.10000	0.10000	0.00000	0.000025
1	1.00000	1.00000	0.00000	0.000027
2	2.00002	2.00002	0.00000	0.000028
5	5.00002	5.00003	0.00001	0.000031
10	10.00002	10.00004	0.00002	0.000036
20	20.00002	20.00002	0.00000	0.000049
30	30.00004	30.00003	-0.00001	0.000089
40	40.00005	40.00003	-0.00002	0.000099
50	50.00002	50.00001	-0.00001	0.000089

SOP FM 33 03 February 2022

Certificate of Calibration

Model Number : MSE125P-100-DU Certificate No. : 24BC10071
Description : Semi-micro Balance Issued Date : Friday, February 23, 2024
Serial Number : 0033108993 Reference No. : 229196
ID No. : RYG_EN0004
Manufacturer : Sartorius Page No. : 3 of 3

Calibration Results : Without Adjustment

Repeatability		Eccentricity (Off-center loading error)	
The repeatability is the ability of a weighing instrument to display nearly identical readouts under constant test conditions when the same load within a measurement range is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express reproducibility quantitatively.		The off-center loading error is yielded by the difference between the readout of the load, i.e. 1/3 or 1/4 of maximum capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to GIM, R76).	
Nominal Value : (Low Load)	100.0000	50 g	
100 g	100.0000	50.0000	
Tolerance	100.0000	50.0000	
0.000015 g	100.0000	50.0000	
	100.0000	50.0000	
Nominal Value : (High Load)	100.0000	50 g	
100 g	100.0000	50.0000	
Tolerance	100.0000	50.0000	
0.000015 g	100.0000	50.0000	
	100.0000	50.0000	
Standard Deviation	0.00003		

Linearity				
The linearity, also called linearity error, describes the deviation of the characteristic curve of a weighing instrument from the linear slope.				
Tolerance	0.0001 g			
Nominal Value (g)	Conventional Mass Value (g)	Displayed Value (g)	Deviation (g)	Uncertainty (g)
65	65.0000	65.0000	0.0000	0.00015
70	70.0000	70.0000	0.0000	0.00015
75	75.0001	75.0000	-0.0001	0.00015
80	80.0001	80.0000	-0.0001	0.00016
85	85.0002	85.0001	0.0000	0.00018
90	90.0003	90.0001	0.0000	0.00017
95	95.0003	95.0001	0.0000	0.00019
100	100.0000	100.0000	0.0000	0.00024
110	110.0000	110.0000	0.0000	0.00026
120	120.0000	120.0000	0.0000	0.00026

End of Report

SOP FM 33 03 February 2022

Certificate of System Qualification

GC-QQ

System ID: CN11461066
Organization Name: ALS Laboratory Group (Thailand) Co., Ltd.
Organization Location: 104 Soi 40 Phatthanakan Rd, Klong Suan Luang, Khet Suan Luang, Bangkok 10250

Date: April 21, 2023 3:26:38 PM
EQP Name: AgilentRecommended.
EQP Revision: GC.02.52
Overall Qualification Status: Pass

CDS Logon Verification - GC

Logon: Saenguthai Tarak

Overall CDS Logon Verification - GC Test Status
Pass

System Inspection and Basic Safety and Operation

Name: 7890
Setpoint Status: Pass

Overall System Inspection and Basic Safety and Operation Test Status
Pass

Inlet Pressure Decay

Name: 7890
Front SSL
Setpoint Status: Pass
Pressure: 25.0 psi
Pressure Change: -0.1 psi /5 minutes
Agilent Recommended: >= -2.0 and <= 0.5

Date: April 21, 2023 3:26:38 PM
System ID: CN11461066

Overall Inlet Pressure Decay Test Status

Pass

Inlet Pressure Accuracy

Name: 7890
Front SSL
Setpoint Status: Pass
Inlet Pressure: 25.0 psi Actual: 25.2 psi
Accuracy: 0.2 psi
Agilent Recommended: <= 1.2

Overall Inlet Pressure Accuracy Test Status

Pass

Inlet Pressure Decay

Name: 7890
Back SSL
Setpoint Status: Pass
Pressure: 25.0 psi
Pressure Change: 0.0 psi /5 minutes
Agilent Recommended: >= -2.0 and <= 0.5

Overall Inlet Pressure Decay Test Status

Pass

Inlet Pressure Accuracy

Name: 7890
Back SSL

Date: April 21, 2023 3:26:38 PM
System ID: CN11461066

Setpoint Status: **Pass**

Setpoint: **25.0** psi Actual: **24.8** psi

Inlet Pressure: **25.0** psi

Accuracy: **0.2** psi

Agilent Recommended: **<= 1.2** psi

Overall Inlet Pressure Accuracy Test Status

Pass

Detector Flow Accuracy

Name: **7890**

Front **FID**

Setpoint Status: **Pass**

Flow Type: **Fuel**

Setpoint: **30.0** mL/min Measured Flow: **28.9** mL/min

Accuracy: **1.1** mL/min

Agilent Recommended: **<= 10.0** % setpoint (**3.0** mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Setpoint Status: **Pass**

Flow Type: **Oxidizer**

Setpoint: **400.0** mL/min Measured Flow: **400** mL/min

Accuracy: **0.0** mL/min

Agilent Recommended: **<= 10.0** % setpoint (**40.0** mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Setpoint Status: **Pass**

Flow Type: **Makeup**

Setpoint: **25.0** mL/min Measured Flow: **24.9** mL/min

Accuracy: **0.1** mL/min

Agilent Recommended: **<= 10.0** % setpoint (**2.5** mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Date: April 21, 2023 3:26:38 PM
System ID: CN11481068

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Overall Detector Flow Accuracy Test Status

Pass

Detector Flow Accuracy

Name: **7890**

Back **FID**

Setpoint Status: **Pass**

Flow Type: **Fuel**

Setpoint: **30.0** mL/min Measured Flow: **30.7** mL/min

Accuracy: **0.7** mL/min

Agilent Recommended: **<= 10.0** % setpoint (**3.0** mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Setpoint Status: **Pass**

Flow Type: **Oxidizer**

Setpoint: **400.0** mL/min Measured Flow: **399** mL/min

Accuracy: **1.0** mL/min

Agilent Recommended: **<= 10.0** % setpoint (**40.0** mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Setpoint Status: **Pass**

Flow Type: **Makeup**

Setpoint: **25.0** mL/min Measured Flow: **24.8** mL/min

Accuracy: **0.4** mL/min

Agilent Recommended: **<= 10.0** % setpoint (**2.5** mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Overall Detector Flow Accuracy Test Status

Pass

GC Oven Temperature Accuracy

Name: **7890**

Date: April 21, 2023 3:26:38 PM
System ID: CN11481068

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Setpoint Status: **Pass**

Zone: **Oven**

Setpoint/Actual: **230.0** / **230.6** °C

Temperature: **230.0** °C

Accuracy: **0.6** °C

Agilent Recommended: **>= -1.0** % setpoint in K (**-5.0** °C)
<= 1.0 % setpoint in K (**5.0** °C)

Setpoint Status: **Pass**

Zone: **Oven**

Setpoint/Actual: **100.0** / **100.9** °C

Temperature: **100.0** °C

Accuracy: **0.9** °C

Agilent Recommended: **>= -1.0** % setpoint in K (**-3.7** °C)
<= 1.0 % setpoint in K (**3.7** °C)

Overall GC Oven Temperature Accuracy Test Status

Pass

GC Oven Temperature Stability

Name: **7890**

Setpoint Status: **Pass**

Setpoint/Average: **100.0** / **100.8833** °C

Temperature: **100.0** °C

Stability: **0.1** °C

Agilent Recommended: **<= 0.5** °C

Overall GC Oven Temperature Stability Test Status

Pass

Scouting Run

Tested Combination1: **Front** **SSL** / **Front** **FID**

Name: **7693A**

Date: April 21, 2023 3:26:38 PM
System ID: CN11481068

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Setpoint Status: **Completed**

Injection Volume on Column: **1.0** µL

Overall Scouting Run Status

Completed

Noise and Drift

Tested Combination1: **Front** **SSL** / **Front** **FID**

Name: **7890**

Setpoint Status: **Pass**

Base Signal: **22.7** pA

ASTM Noise: **0.06** pA

Drift: **0.05** pA/hr

Agilent Recommended: **<= 0.10** pA

Status: **Pass**

Overall Noise and Drift Test Status

Pass

Injection Precision

Tested Combination1: **Front** **SSL** / **Front** **FID**

Name: **7693A**

Setpoint Status: **Pass**

Injection Volume on Column: **1.0** µL

Area RSD: **0.32** % Retention Time RSD: **0.67** %

Agilent Recommended: **<= 3.00** %

Overall Injection Precision Test Status

Pass

Signal to Noise

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System ID: CN11481068

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Tested Combination1 Front SSL / Front FID
Injection Tower
Name: 7890
Setpoint Status: Pass
Signal to Noise: 721755
Agilent Recommended: >= 300000
Overall Signal to Noise Test Status
Pass

Scouting Run

Tested Combination2 Back SSL / Back FID
Injection Tower
Name: 7693A
Setpoint Status: Completed
Injection Volume on Column: 1.0 µL
Overall Scouting Run Status
Completed

Noise and Drift

Tested Combination2 Back SSL / Back FID
Name: 7890
Setpoint Status: Pass
Bass Signal: 22.6 pA
ASTM Noise pA 0.07
Agilent Recommended: <= 0.10
Status: Pass
Drift pA/Hr 0.09
Agilent Recommended: <= 2.50
Status: Pass

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System ID: CN11461066

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Overall Noise and Drift Test Status

Pass

Injection Precision

Tested Combination2 Back SSL / Back FID
Name: 7693A
Setpoint Status: Pass
Injection Volume on Column: 1.0 µL
Area RSD: 1.28 %
Agilent Recommended: <= 3.00
Retention Time RSD: 0.83 %
Agilent Recommended: <= 1.00

Overall Injection Precision Test Status

Pass

Signal to Noise

Tested Combination2 Back SSL / Back FID
Injection Tower
Name: 7890
Setpoint Status: Pass
Signal to Noise: 2404398
Agilent Recommended: >= 300000

Overall Signal to Noise Test Status

Pass

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System ID: CN11461066

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Instrument Details

Purpose

This section describes the as found system configuration.

Details

System
System ID: CN11461066
Manufacturer: Agilent Technologies
Name: 7890
Flow Data Input: Manual Data
Temperature Data Input: Manual Data or Other Data Logging
Tested Combination1
Injection Technique: Injection Tower
Sampler Identifier: Sampler 2
Inlet: Front
Detector: Front
LTM Included?: No
Tested Combination2
Injection Technique: Injection Tower
Sampler Identifier: Sampler 3
Inlet: Back
Detector: Back
LTM Included?: No
Sampler 1
Manufacturer: Agilent Technologies
Type: Tray
Name: 7693A
Model Number: G4514A
Serial Number: CN15386030
Firmware Revision: A.11.01
Vial Heater: Not installed

Date: April 21, 2023 3:26:38 PM
System ID: CN11461066

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Sampler 2
Manufacturer: Agilent Technologies
Type: Injection Tower
Name: 7693A
Model Number: G4513A
Serial Number: CN16280128
Firmware Revision: A.10.09
Usage: Sample Injection
Location: Front
Syringe Volume (µL): 10
Sampler 3
Manufacturer: Agilent Technologies
Type: Injection Tower
Name: 7693A
Model Number: G4513A
Serial Number: CN10340103
Firmware Revision: A.10.09
Usage: Sample Injection
Location: Back
Syringe Volume (µL): 10
Mainframe 1
Manufacturer: Agilent Technologies
Name: 7890
Model Number: G3440A
Serial Number: CN11461066
Firmware Revision: Version 4.27
Oven Type: Standard

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Inlet 1

Manufacturer	Agilent Technologies
Name	7890
Type	SSL
Location	Front
Carrier Gas	Helium
Control Type	Electronic Pressure Control (EPC)
Purged Inlet	Yes

Inlet 2

Manufacturer	Agilent Technologies
Name	7890
Type	SSL
Location	Back
Carrier Gas	Helium
Control Type	Electronic Pressure Control (EPC)
Purged Inlet	Yes

Detector 1

Manufacturer	Agilent Technologies
Name	7890
Type	FID
Adapter	Capillary
Control Type	Electronic Pressure Control (EPC)
Location	Front
Makeup Gas	Nitrogen

Detector 2

Manufacturer	Agilent Technologies
Name	7890
Type	FID
Adapter	Capillary
Control Type	Electronic Pressure Control (EPC)
Location	Back
Makeup Gas	Nitrogen

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System ID: CN11461068

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Electronic Signature

Purpose

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Details

Full Name of Signer: Saenguthai Terak
Logged On User Name: saenguthai.terak@non.agilent.com
Signature Creation Date: April 21, 2023
Reason for Signature: Executed protocol and published this original version of document

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System ID: CN11461068

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User Name: saenguthai.terak
Host Name: LAPTOP-CQ39K09Y

System ID: CN11461068
Print Date: April 21, 2023 3:26:40 PM

GC-6_BKK_BN0127_ALS Transaction Log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 21, 2023 11:21:09 AM	Auth	Session Created	Session	None
April 21, 2023 11:21:09 AM	Start	Configuration	Session	None
April 21, 2023 11:21:09 AM	Auth	Unlocks	Logging	User is Temporarily on-0 does not require an unlock code
April 21, 2023 11:22:04 AM	Auth	Unlocks	Session	EDP details for primary technique (Pd) - File path: [ProtocolFolderGoGo\Configurat ions\02_S2(GC-02_S2.asp) EDP File Name: [GC-02_S2_Asp].EDP Name: [Agilent\Instrument\GC-02_S2_02] Protocol Revision: (S2-02-02)
April 21, 2023 11:22:05 AM	End	Configuration	Session	None
April 21, 2023 11:22:34 AM	Start	Qualitative	Session	QQ
April 21, 2023 11:22:34 AM	Start	Execution	CDS Logon Verification - GC - Qualitative test	None
April 21, 2023 11:23:34 AM	End	Execution	CDS Logon Verification - GC - Qualitative test	Run Count: 1
April 21, 2023 11:23:36 AM	Start	Execution	System Inspection and Basic Safety and Operation - 7890 - Qualitative Test - No response associated	None
April 21, 2023 11:23:36 AM	End	Execution	System Inspection and Basic Safety and Operation - 7890 - Qualitative Test - No response associated	Run Count: 1
April 21, 2023 11:23:37 AM	Start	Execution	Inlet Pressure Decay - Front SSL - Pressure Controlled Inlet - S: 25.0 psi - L: <= -2.0 psi and - <= 0.5 psi	None

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Date: April 21, 2023 3:26:38 PM
System ID: CN11461068

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User Name: saenguthai.terak
Host Name: LAPTOP-CQ39K09Y

System ID: CN11461068
Print Date: April 21, 2023 3:26:40 PM

GC-6_BKK_BN0127_ALS Transaction Log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 21, 2023 11:24:01 AM	End	Execution	Inlet Pressure Decay - Front SSL - Pressure Controlled Inlet - S: 25.0 psi - L: <= -2.0 psi and - <= 0.5 psi	Run Count: 1
April 21, 2023 11:24:04 AM	Start	Execution	Inlet Pressure Accuracy - Front SSL - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	None
April 21, 2023 11:24:09 AM	End	Execution	Inlet Pressure Accuracy - Front SSL - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	Run Count: 1
April 21, 2023 11:24:11 AM	Start	Execution	Inlet Pressure Decay - Back SSL - Pressure Controlled Inlet - S: 25.0 psi - L: <= -2.0 psi and - <= 0.5 psi	None
April 21, 2023 11:24:45 AM	End	Execution	Inlet Pressure Decay - Back SSL - Pressure Controlled Inlet - S: 25.0 psi - L: <= -2.0 psi and - <= 0.5 psi	Run Count: 1
April 21, 2023 11:24:45 AM	Start	Execution	Inlet Pressure Accuracy - Back SSL - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	None
April 21, 2023 11:24:51 AM	End	Execution	Inlet Pressure Accuracy - Back SSL - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	Run Count: 1
April 21, 2023 11:24:53 AM	Start	Execution	Detector Flow Accuracy - Front FID - Type: Fuel - S: 30.0 mL/min - L: <= 92.0% response	None
April 21, 2023 11:25:20 AM	Auth	Data	Detector Flow Accuracy - Front FID - Type: Fuel - S: 30.0 mL/min - L: <= 92.0% response	Manual Data Entry
April 21, 2023 11:25:25 AM	End	Execution	Detector Flow Accuracy - Front FID - Type: Fuel - S: 30.0 mL/min - L: <= 92.0% response	Run Count: 1

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Date: April 21, 2023 3:26:38 PM
System ID: CN11461068

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User Name: kangnuth@freenet
IP: 81.63.1mo; LAPTOP-CQ35K0AMV

System ID: CN11481038
Print Date: April 21, 2023 3:28:48 PM

DC-8 BKK EN0127 ALS Transaction log 1

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 21, 2023 11:29:26 AM	Start	Execution	Detector Flow Accuracy - Front FID - Type: Galdaner - S: 400.0 mL/min - L: <= 10.0% setpoint	None
April 21, 2023 11:29:40 AM	Audit	Data	Detector Flow Accuracy - Front FID - Type: Galdaner - S: 400.0 mL/min - L: <= 10.0% setpoint	Manual Data Entry
April 21, 2023 11:29:42 AM	End	Execution	Detector Flow Accuracy - Front FID - Type: Galdaner - S: 400.0 mL/min - L: <= 10.0% setpoint	Run Count: 1
April 21, 2023 11:29:44 AM	Start	Execution	Detector Flow Accuracy - Front FID - Type: Makeup - S: 25.0 mL/min - L: <= 10.0% setpoint	None
April 21, 2023 11:29:51 AM	Audit	Data	Detector Flow Accuracy - Front FID - Type: Makeup - S: 25.0 mL/min - L: <= 10.0% setpoint	Manual Data Entry
April 21, 2023 11:29:54 AM	End	Execution	Detector Flow Accuracy - Front FID - Type: Makeup - S: 25.0 mL/min - L: <= 10.0% setpoint	Run Count: 1
April 21, 2023 11:29:58 AM	Start	Execution	Detector Flow Accuracy - Back FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% setpoint	None
April 21, 2023 11:30:16 AM	Audit	Data	Detector Flow Accuracy - Back FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% setpoint	Manual Data Entry
April 21, 2023 11:30:22 AM	End	Execution	Detector Flow Accuracy - Back FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% setpoint	Run Count: 1
April 21, 2023 11:30:24 AM	Start	Execution	Detector Flow Accuracy - Back FID - Type: Catalyst - S: 400.0 mL/min - L: <= 10.0% setpoint	None
April 21, 2023 11:30:38 AM	Audit	Data	Detector Flow Accuracy - Back FID - Type: Catalyst - S: 400.0 mL/min - L: <= 10.0% setpoint	Manual Data Entry

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Date: April 21, 2023 3:26:38 PM
System ID: CN11461065

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User Name: siddiguthal@arab
Host name: LAPTOP-CD15K0M5

System ID: C7419481060
 Model Name: April 21, 2023 3:06:40 PM

GC-4 8006_EN0123_ALS Transaction log.c

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 21, 2023 11:26:43 AM	Exec	Execution	Derivative Flow Accuracy - Black FID - Type : Oxidize - S: 450.0 mL/min - L: ~ 10.0% support	Run Count : 1
April 21, 2023 11:28:45 AM	Start	Execution	Derivative Flow Accuracy - Black FID - Type : Methyl - S: 25.0 mL/min - L: ~ 10.0% support	None
April 21, 2023 11:27:01 AM	Acq	Data	Derivative Flow Accuracy - Black FID - Type : Methyl - S: 25.0 mL/min - L: ~ 10.0% support	Manual Data Entry
April 21, 2023 11:27:05 AM	Exec	Execution	Derivative Flow Accuracy - Black FID - Type : Methyl - S: 35.0 mL/min - L: ~ 10.0% support	Run Count : 1
April 21, 2023 11:27:07 AM	Start	Execution	GC Oven Temperature Accuracy : 780.0 - Temperature Oven - S: 230.0°C - L: ~ -1.0 AND ~ 1.0 % support in R	None
April 21, 2023 11:27:33 AM	Acq	Data	GC Oven Temperature Accuracy : 780.0 - Temperature Oven - S: 230.0°C - L: ~ -1.0 AND ~ 1.0 % support in R	Manual Data Entry
April 21, 2023 11:27:35 AM	End	Execution	GC Oven Temperature Accuracy : 780.0 - Temperature Oven - S: 230.0°C - L: ~ -1.0 AND ~ 1.0 % support in R	Run Count : 1
April 21, 2023 11:27:37 AM	Start	Execution	GC Oven Temperature Accuracy : 780.0 - Temperature Oven - S: 100.0°C - L: ~ -1.0 AND ~ 1.0 % support in R	None
April 21, 2023 11:27:54 AM	Acq	Data	GC Oven Temperature Accuracy : 780.0 - Temperature Oven - S: 100.0°C - L: ~ -1.0 AND ~ 1.0 % support in R	Manual Data Entry

Figure 2.94

Date: April 21, 2023 3:26:38 PM
System ID: CH11461065

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User Name: xiangyuhe1234
Hostname: LAPTOP-CQ3SKOMH

System ID: CH16401086
Print Date: April 21, 2023 3:26:49 PM

GC-6 DKK EN0127 ALS Transaction Log

Title	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 21, 2023 11:27:37 AM End	Execution	QC Oven Temperature Accuracy - 789C - Temperature Oven = S 105.0°C - L = -1.0 ACC => 1.0 % accepted @ K	Run Count : 1	
April 21, 2023 11:27:59 AM Start	Execution	QC Oven Temperature Stability - Noise - 789C - Temperature - Over - S: 105.0°C - L: => 0.5°C	Noise	
April 21, 2023 11:28:07 AM Audit	Data	QC Oven Temperature Stability - 789C - Temperature - Over - S: 100.0°C - L: => 0.5°C	Manual Data Entry	
April 21, 2023 11:26:10 AM End	Execution	QC Oven Temperature Stability - 789C - Temperature - Over - S: 100.0°C - L: => 0.5°C	Run Count : 1	
April 21, 2023 11:29:12 AM Start	Execution	QC Styling Mini - Application Time: Front SSL, Front FID - Part of System Preparation - No limits associated	None	
April 21, 2023 11:30:27 AM Audit	Data	QC Sampling Run - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Data Web Path: C:\Users\PLM\Documents\GC-8 _Injection\INJECTION_QC-8 _AUG_2023-04-20\QC-8 _2023-03-04-20\QC-8 16-38-06P_2023-04-20\QC-8 A	
April 21, 2023 11:31:04 AM End	Execution	QC Sampling Run - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Run Count : 1	
April 21, 2023 11:31:07 AM Start	Execution	Molecular Weight - Flow Injection Electrical FID - 1.0 pSec) vs 0.10 pA - L (DMS) ==> 2.50 pA/mV	None	

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Date: April 21, 2023 3:26:38 PM
System ID: CN11481066

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Other Name(s) *salpingothelasma*
 Monoculture: L. ARTIFICIOSUS/MS

System 12, Cyl 145 (R56)
 1994 State Acad. 71, 2023 1-20, 146 RM

DC-6, BKK, EN0127, ALS Transaction log 1

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 21, 2023 11:37:43 AM	Auto	Data	Nodevare D98 - Front FID - Detector FID - L (Wear) <= 0.10 PA - L (Wear) <= 2.50 pA/psi	Data File Path : C:\Users\Public\Documents\hemadison\20240302_05_ALS_202304-28\O2_CO_2023_2022-04-20_1638-08\FID-L-0135.D\FID-L.tch
April 21, 2023 11:38:00 AM	Auto	Emission	Nodevare D98 - Front FID - Detector FID - L (Wear) <= 0.10 PA - L (Wear) <= 2.50 pA/psi	Data File Path : C:\Users\Public\Documents\hemadison\20240302_05_ALS_202304-28\O2_CO_2023_2022-04-20_1638-08\FID-L-0135.D\FID-L.tch
April 21, 2023 11:38:03 AM	Start	Execution	Injection Precision - Injection Tower, Front ISS, Front FID - GC - L (Wear) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path : C:\Users\Public\Documents\hemadison\20240302_05_ALS_202304-28\O2_CO_2023_2022-04-20_1638-08\FID-L-0135.D\FID-L.tch
April 21, 2023 11:38:23 AM	Start	Execution	Injection Precision - Injection Tower, Front ISS, Front FID - GC - L (Wear) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path : C:\Users\Public\Documents\hemadison\20240302_05_ALS_202304-28\O2_CO_2023_2022-04-20_1638-08\FID-L-0135.D\FID-L.tch
April 21, 2023 11:39:25 AM	Auto	Data	Injection Precision - Injection Tower, Front ISS, Front FID - GC - L (Wear) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path : C:\Users\Public\Documents\hemadison\20240302_05_ALS_202304-28\O2_CO_2023_2022-04-20_1638-08\FID-L-0135.D\FID-L.tch
April 21, 2023 11:39:55 AM	Auto	Data	Injection Precision - Injection Tower, Front ISS, Front FID - GC - L (Wear) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path : C:\Users\Public\Documents\hemadison\20240302_05_ALS_202304-28\O2_CO_2023_2022-04-20_1638-08\FID-L-0135.D\FID-L.tch

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Date: April 21, 2023 3:26:38 PM
System ID: CH11461066

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User Name: sainguthul tarak
Hostname: LAPTOP-CQ35K0MV

System #: CN11461086
Print Date: April 21, 2023 2:29:40 PM

GC-4_DKK_EN9127_ALS Transaction log :

[illegible]

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Date: April 21, 2023 3:26:38 PM
System ID: CN11481066

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User Name: soengulink.tark
Hosname: LAPTOP-C033K0WV

System je CHT441018
Print Date: April 21, 2023 12:04:00 PM

GC-6, UNK, EN0127, ALS Transaction App 1

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 21, 2023 11:05:28 AM	Auth	Data	Signal to Hosts - Injection Tower, Back BSL, Back FID - Detector FID - L1 => 300000	Data Base Path: C:\Users\Public\Documents\hem5al\on\Task00_OC- _ALS_2023-04-20\OC_OC- _2023-04-20-01 1A-06-08SP_Ferr.D\FIDAL ch
April 21, 2023 11:06:40 AM	Start	Execution	Signal to Hosts - Injection Tower, Front BSL, Front FID - Detector FID - L1 => 300000	Run Count: 1
April 21, 2023 11:06:03 AM	Start	Execution	QC Spooling Run - Injection Tower, Back BSL, Back FID - Part of System Preparation - No limits associated	None
April 21, 2023 11:06:38 AM	Auth	Data	QC Spooling Run - Injection Tower, Back BSL, Back FID - Part of System Preparation - No limits associated	Data Base Path: C:\Users\Public\Documents\hem5al\on\Task00_OC- _ALS_2023-04-20\OC_OC- _2023-04-20-01 1A-06-08S_SCD.D\FID2Ch h
April 21, 2023 11:07:30 AM	End	Execution	QC Spooling Run - Injection Tower, Back BSL, Back FID - Part of System Preparation - No limits associated	Run Count: 1
April 21, 2023 11:07:32 AM	Start	Execution	Notes and GRI - Back FID - Detector FID - L1 (Notes) => 0.19 g/L - IDity => 2.50 SAV=	None

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Date: April 21, 2023 3:26:38 PM
System ID: CH11461056

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User Name: saangithal laas
Hostname: LAPTOP-CC3SKOMV

System ID: C91439966
Print Date: April 21, 2023 3:25:48 PM

GC-4_DWK_EN0127_ALS Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 21, 2023 11:08:06 AM AUST		Data	Notes and Drill - Back FID - Detector FID - L (Notes) => 0.10 pA - L (Duty) => 2.50 pA/Min	Data File Path: C:\Users\Public\Documents\NewStatusOfData\OC4_AUS_2023-04-20\OC4_AUS_2023-04-20_2023-04-21_14-35-09\OC4-01-0038.D\FID 28.ch
April 21, 2023 11:08:23 AM END		Execution	Notes and Drill - Back FID - Detector FID - L (Notes) => 0.10 pA - L (Duty) => 2.50 pA/Min	Run Count: 1
April 21, 2023 11:38:32 AM START		Injection Precision	Injection Precision - Injection Tower, Back SCL, Back FID - GC - L (Ave) => 3.00% - L (Rel. Time) => 1.60%	None
April 21, 2023 11:39:51 AM START		Injection Precision	Injection Precision - Injection Tower, Back SCL, Back FID - GC - L (Ave) => 3.60% - L (Rel. Time) => 1.60%	None
April 21, 2023 11:40:17 AM AUST		Data	Injection Precision - Injection Tower, Back SCL, Back FID - GC - L (Ave) => 3.80% - L (Rel. Time) => 1.60%	Data File Path: C:\Users\Public\Documents\NewStatusOfData\OC4_AUS_2023-04-20\OC4_AUS_2023-04-20_2023-04-21_10-47-37\Pre11-0048.D\FID 28.ch
April 23, 2023 11:42:17 AM AUST		Data	Injection Precision - Injection Tower, Back SCL, Back FID - GC - L (Ave) => 3.60% - L (Rel. Time) => 1.70%	Data File Path: C:\Users\Public\Documents\NewStatusOfData\OC4_AUS_2023-04-20\OC4_AUS_2023-04-20_2023-04-21_10-47-32\Pre11-0058.D\FID 28.ch

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Date: April 21, 2023 3:26:38 PM
System ID: CN11481056

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User Name: skenguchal.jarak
Hostname: LAPTOP-CD58Q8M6

System ID: CN11451080
Print Date: April 21, 2021 3:25:40 PM

UC-6_BROK_END0127_ALS Transaction log

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 21, 2023 11:40:17 AM Audit	Audit	Data	Injection Precision - Injection Tower, Back SSL, Back FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path: C:\Users\Public\Documents\HemScan\GC\GC\GC_OO_C4- _ALS_2023-04-20\GC_OO_C4- _2023_Fin 2023-04-21 10-37-32\Fin11-008B.D\FID 28.ch
April 21, 2023 11:40:17 AM Audit	Audit	Data	Injection Precision - Injection Tower, Back SSL, Back FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path: C:\Users\Public\Documents\HemScan\GC\GC\GC_OO_C4- _ALS_2023-04-20\GC_OO_C4- _2023_Fin 2023-04-21 10-37-32\Fin11-007B.D\FID 28.ch
April 21, 2023 11:40:21 AM Audit	Audit	Data	Injection Precision - Injection Tower, Back SSL, Back FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path: C:\Users\Public\Documents\HemScan\GC\GC\GC_OO_C4- _ALS_2023-04-20\GC_OO_C4- _2023_Fin 2023-04-21 10-37-32\Fin11-008B.D\FID 28.ch
April 21, 2023 11:40:21 AM Audit	Audit	Data	Injection Precision - Injection Tower, Back SSL, Back FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path: C:\Users\Public\Documents\HemScan\GC\GC\GC_OO_C4- _ALS_2023-04-20\GC_OO_C4- _2023_Fin 2023-04-21 10-37-32\Fin11-008B.D\FID 28.ch
April 21, 2023 11:40:21 AM Audit	Audit	Data	Injection Precision - Injection Tower, Back SSL, Back FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path: C:\Users\Public\Documents\HemScan\GC\GC\GC_OO_C4- _ALS_2023-04-20\GC_OO_C4- _2023_Fin 2023-04-21 10-37-32\Fin11-008B.D\FID 28.ch
April 21, 2023 11:41:29 AM End	End	Execution	Injection Precision - Injection Tower, Back SSL, Back FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Run Count: 1
May 11, 2023 11:41:33 AM Start	Start	Execution	Signal to Hold - Injection Tower, Back SSL, Back FID - Detector FID - L >= 30000	None

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Date: April 21, 2023 3:26:38 PM
System ID: CN11401066

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User Name: Saengulhai.Tarak
Machine: LAPTOP-G335QWVSystem ID: CN11481066
Print Date: April 21, 2023 3:28:43 PM

GC-6_BKK_EN0127_ALS Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
April 21, 2023 11:42:22 AM	Fail	Data	Signal to Mass - Injection Tower, Back SSL, Back FID - Detector FID - L, HP-30500	Data File Path: C:\Users\Public\Documents\Saengulhai.Tarak\GC-6_BKK_EN0127_ALS_2023-04-20_14-35-09\SW_Bak.D\FID02B.D
April 21, 2023 11:42:50 AM	End	Evacuation	Signal to Mass - Injection Tower, Back SSL, Back FID - Detector FID - L, HP-30500	Run Count: 1
April 21, 2023 11:42:53 AM	End	Qualification	Session	DQ
April 21, 2023 11:42:53 AM	Start	Reporting	Session	None
April 21, 2023 12:01:47 PM	Auto	Not Closed	Session	None
April 21, 2023 2:16:07 PM	Auto	Acquisition	Session	None
April 21, 2023 3:19:10 PM	Auto	Injection/Retained	Session	None
April 21, 2023 3:19:31 PM	Start	Qualification	Session	DQ
April 21, 2023 3:20:08 PM	Auto	Acquisition	Session	None
April 21, 2023 3:21:00 PM	Auto	Injection/Retained	Session	None
April 21, 2023 3:21:07 PM	Start	Qualification	Session	DQ
April 21, 2023 3:25:45 PM	Auto	Reporting	Session	Report Generated: Certificate

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Date: April 21, 2023 3:28:38 PM
System ID: CN11481066

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Certificate of System Qualification
GC-OQ

System ID: GC-6_CN11481066
Organization Name: ALS Laboratory Group (Thailand) Co., Ltd.
Organization Location: 104 Soi 40 Phatthanakan Rd, Khwang Suan Luang, Khet Suan Luang, Bangkok 10250

Date: October 22, 2024 9:27:05 AM
EQP Name: Agilent Recommended
EDP Revision: GC.02.53
Overall Qualification Status: Pass

REVIEW BY: *Juda K.*
APPROVED BY: *Vampran N.*
NEXT CAL DATE: 22 Apr 2026

CDS Logon Verification - GC

Logon: Saengulhai.Tarak

Overall CDS Logon Verification - GC Test Status

Pass

System Inspection and Basic Safety and Operation

Name: 7890

Setpoint Status: Pass

Overall System Inspection and Basic Safety and Operation Test Status

Pass

Inlet Pressure Decay

Name: 7890

Front SSL

Setpoint Status: Pass

Pressure: 25.0 psi

Pressure Change: 0.0 psi / 5 minutes

Agilent Recommended: >= -2.0 and <= 0.5

Date: October 22, 2024 9:27:05 AM

System ID: GC-6_CN11481066

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Overall Inlet Pressure Decay Test Status

Pass

Inlet Pressure Accuracy

Name: 7890

Front SSL

Setpoint Status: Pass

Setpoint: 25.0 psi Actual: 25.07 psi

Accuracy: 0.1 psi

Agilent Recommended: <= 1.2

Overall Inlet Pressure Accuracy Test Status

Pass

Inlet Pressure Decay

Name: 7890

Back SSL

Setpoint Status: Pass

Pressure: 25.0 psi

Pressure Change: 0.0 psi / 5 minutes

Agilent Recommended: >= -2.0 and <= 0.5

Overall Inlet Pressure Decay Test Status

Pass

Inlet Pressure Accuracy

Name: 7890

Back SSL

Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CN11481066

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Setpoint Status: Pass

Setpoint: 25.0 psi Actual: 25.06 psi

Accuracy: 0.1 psi

Agilent Recommended: <= 1.2

Overall Inlet Pressure Accuracy Test Status

Pass

Detector Flow Accuracy

Name: 7890

Front FID

Setpoint Status: Pass

Flow Type: Fuel
Setpoint: 30.0 mL/min Measured Flow: 28.6 mL/min

Accuracy: 1.2 mL/min

Agilent Recommended: <= 10.0 % setpoint (3.0 mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Setpoint Status: Pass

Flow Type: Oxidizer
Setpoint: 400.0 mL/min Measured Flow: 392 mL/min

Accuracy: 8.0 mL/min

Agilent Recommended: <= 10.0 % setpoint (40.0 mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Setpoint Status: Pass

Flow Type: Makeup
Setpoint: 25.0 mL/min Measured Flow: 25.4 mL/min

Accuracy: 0.4 mL/min

Agilent Recommended: <= 10.0 % setpoint (2.5 mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CN11481066

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Overall Detector Flow Accuracy Test Status

Pass

Detector Flow Accuracy

Name: 7890
Back FID

Setpoint Status: Pass

Flow Type: Fuel

Setpoint: 30.0 mL/min Measured Flow: 30.6 mL/min

Accuracy: 0.8 mL/min

Agilent Recommended: ≤ 10.0 % setpoint (3.0 mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Setpoint Status: Pass

Flow Type: Oxidant

Setpoint: 400.0 mL/min Measured Flow: 393 mL/min

Accuracy: 7.0 mL/min

Agilent Recommended: ≤ 10.0 % setpoint (40.0 mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Setpoint Status: Pass

Flow Type: Makeup

Setpoint: 25.0 mL/min Measured Flow: 25.2 mL/min

Accuracy: 0.2 mL/min

Agilent Recommended: ≤ 10.0 % setpoint (2.5 mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Overall Detector Flow Accuracy Test Status

Pass

GC Oven Temperature Accuracy

Name: 7890

Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CN11461066

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Setpoint Status: Pass

Zone: Oven

Setpoint/Actual: 230.0 230.3 °C

Temperature: 230.0 230.3 °C

Accuracy: 0.3 °C

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

Setpoint Status: Pass

Zone: Oven

Setpoint/Actual: 100.0 100.0 °C

Temperature: 100.0 100.0 °C

Accuracy: 0.0 °C

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

Overall GC Oven Temperature Accuracy Test Status

Pass

GC Oven Temperature Stability

Name: 7890

Setpoint Status: Pass

Setpoint/Average: 100.0 100.0167 °C

Temperature: 100.0 100.0167 °C

Stability: 0.1 °C

Agilent Recommended: ≤ 0.5 °C

Overall GC Oven Temperature Stability Test Status

Pass

Scouting Run

Tested Combination1 Front SSL / Front FID

Injection Tower

Name: 7693A

Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CN11461066

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Setpoint Status: Completed

Injection Volume on Column: 1.0 uL

Overall Scouting Run Status

Completed

Noise and Drift

Tested Combination1 Front SSL / Front FID

Name: 7890

Setpoint Status: Pass

Base Signal: 14.05 pA

ASTM Noise pA 0.05

Agilent Recommended: ≤ 0.10

Drift pA/hr 0.03

Agilent Recommended: ≤ 2.50

Status: Pass

Overall Noise and Drift Test Status

Pass

Injection Precision

Tested Combination1 Front SSL / Front FID

Name: 7693A

Setpoint Status: Pass

Injection Volume on Column: 1.0 uL

Area RSD: 0.30 %

Agilent Recommended: ≤ 3.00

Retention Time RSD: 0.63 %

Agilent Recommended: ≤ 1.00

Overall Injection Precision Test Status

Pass

Signal to Noise

Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CN11461066

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Tested Combination1 Front SSL / Front FID

Injection Tower

Name: 7890

Setpoint Status: Pass

Signal to Noise: 11076525

Agilent Recommended: ≥ 300000

Overall Signal to Noise Test Status

Pass

Scouting Run

Tested Combination2 Back SSL / Back FID

Injection Tower

Name: 7693A

Setpoint Status: Completed

Injection Volume on Column: 1.0 uL

Overall Scouting Run Status

Completed

Noise and Drift

Tested Combination2 Back SSL / Back FID

Name: 7890

Setpoint Status: Pass

Base Signal: 13.79 pA

ASTM Noise pA 0.05

Agilent Recommended: ≤ 0.10

Drift pA/hr 0.01

Agilent Recommended: ≤ 2.50

Status: Pass

Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CN11461066

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Overall Noise and Drift Test Status

Pass

Injection Precision

Tested Combination2

BackSSL / BackFID

Name7693A

Setpoint StatusPass

Injection Volume on Column1.0 uL

Area RSD1.06 %

Agilent Recommended<= 3.00

Retention Time RSD0.93 %

Agilent Recommended<= 1.00

Overall Injection Precision Test Status

Pass

Signal to Noise

Tested Combination2

BackSSL / BackFID

NameInjection Tower7690

Setpoint StatusPass

Signal to Noise1771221

Agilent Recommended>= 300000

Overall Signal to Noise Test Status

Pass

DateOctober 22, 2024 9:27:05 AM

System IDGC-6_CN11461066

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Instrument Details

Purpose

This section describes the as found system configuration

Details

System

System IDGC-6_CN11461066

ManufacturerAgilent Technologies

Name7690

Flow Data InputManual Data

Temperature Data InputManual Data or Other Data Logging

Tested Combination1

Injection TechniqueInjection Tower

Sampler IdentifierSampler 1

InletFront

DetectorFront

LTM Included?No

Tested Combination2

Injection TechniqueInjection Tower

Sampler IdentifierSampler 2

InletBack

DetectorBack

LTM Included?No

Sampler 1

ManufacturerAgilent Technologies

TypeInjection Tower

Name7693A

Model NumberG4513A

Serial NumberCNCN10346103

Firmware RevisionA.11.06

UsageSample Injection

LocationFront

Syringe Volume (uL)10

DateOctober 22, 2024 9:27:05 AM

System IDGC-6_CN11461066

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Sampler 2

ManufacturerAgilent Technologies

TypeInjection Tower

Name7693A

Model NumberG4513A

Serial NumberCN16260126

Firmware RevisionA.11.06

UsageSample Injection

LocationBack

Syringe Volume (uL)10

Sampler 3

ManufacturerAgilent Technologies

TypeTray

Name7693A

Model NumberG4514A

Serial NumberCN16380030

Firmware RevisionA.11.03

Vial HeaderNot Installed

Mainframe 1

ManufacturerAgilent Technologies

Name7690

Model NumberG3440A

Serial NumberCN11461066

Firmware RevisionA.01.16

Oven TypeStandard

DateOctober 22, 2024 9:27:05 AM

System IDGC-6_CN11461066

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Inlet 1

ManufacturerAgilent Technologies

Name7690

TypeSSL

LocationFront

Carrier GasHelium

Control TypeElectronic Pressure Control (EPC)

Purged InletYes

Inlet 2

ManufacturerAgilent Technologies

Name7690

TypeSSL

LocationBack

Carrier GasHelium

Control TypeElectronic Pressure Control (EPC)

Purged InletYes

Detector 1

ManufacturerAgilent Technologies

Name7690

TypeFID

AdapterCapillary

Control TypeElectronic Pressure Control (EPC)

LocationFront

Makeup GasNitrogen

Detector 2

ManufacturerAgilent Technologies

Name7690

TypeFID

AdapterCapillary

Control TypeElectronic Pressure Control (EPC)

LocationBack

Makeup GasNitrogen

DateOctober 22, 2024 9:27:05 AM

System IDGC-6_CN11461066

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Electronic Signature

Purpose

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

Details

Full Name of Signer: Saengulhai Tanok
Logged On User Name: saengulhai.tanok@non.agilent.com
Signature Creation Date: October 22, 2024
Reason for Signature: Executed protocol and published this original version of document

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Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CNI1481006

User Name: saengulhai.tanok			System ID: GC-6_CNI1481006	
Report Generated by Hardware: LAPTOP-CQ25XDMV			Print Date: October 22, 2024 9:27:10 AM	
2024_ALS_GC-6_CNI1481006_QDHW Transaction Log:				
Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 21, 2024 3:18:08 PM	Auto	Session Created	Session	None
October 21, 2024 3:16:07 PM	Start	Configuration	Session	None
October 21, 2024 3:16:07 PM	Auto	Environment	Logging	User is Nonplaying and does not require an unlock code.
October 21, 2024 3:22:40 PM	Auto	File Loaded	Session	EDP details for primary: [GC-62.53.ecp] File path: [prepub\pubs\Out\Download\us002\53Gc-62.53.ecp] EDP File Name: [GC-62.53.ecp] EDP Name: [Agilent\Recommended] Press not Release [GC-62.53]
October 21, 2024 3:22:44 PM	End	Configuration	Session	None
October 21, 2024 3:22:47 PM	Start	Qualification	Session	OQ
October 21, 2024 3:22:45 PM	Start	Execution	CD5 Logon Verification - GC-789C - Qualitative test	None
October 21, 2024 3:23:08 PM	End	Execution	CD5 Logon Verification - GC-789C - Qualitative test	Run Count: 1
October 21, 2024 3:23:40 PM	Start	Execution	System Inspection and Basic Safety and Operation - 789C - Qualitative Test - No subtests associated	None
October 21, 2024 3:23:56 PM	End	Execution	System Inspection and Basic Safety and Operation - 789C - Qualitative Test - No subtests associated	Run Count: 1

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Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CNI1481006

User Name: saengulhai.tanok

Report Generated by Hardware: LAPTOP-CQ25XDMV

System ID: GC-6_CNI1481006

Print Date: October 22, 2024 9:27:06 AM

2024_ALS_GC-6_CNI1481006_QDHW Transaction Log:

Time	Transaction State	Activity Performed	Optional Information
October 21, 2024 3:24:01 PM	Start	Execution	Int Pressure Decay - Front: SQL - Pressure Controlled Int - S: 25.0 psi - L: <= 0.5 psi and <= 0.5 psi
October 21, 2024 3:25:06 PM	End	Execution	Int Pressure Decay - Front: SQL - Pressure Controlled Int - S: 25.0 psi - L: <= 0.5 psi and <= 0.5 psi Run Count: 1
October 21, 2024 3:26:28 PM	Start	Execution	Int Pressure Accuracy - Front: SQL - Pressure Controlled Int - S: 25.0 psi - L: <= 1.2 psi
October 21, 2024 3:29:32 PM	End	Execution	Int Pressure Accuracy - Front: SQL - Pressure Controlled Int - S: 25.0 psi - L: <= 1.2 psi Run Count: 1
October 21, 2024 3:25:50 PM	Start	Execution	Int Pressure Decay - Back: SQL - Pressure Controlled Int - S: 25.0 psi - L: <= 0.5 psi and <= 0.5 psi
October 21, 2024 3:26:01 PM	End	Execution	Int Pressure Decay - Back: SQL - Pressure Controlled Int - S: 25.0 psi - L: <= 0.5 psi and <= 0.5 psi Run Count: 1
October 21, 2024 3:29:05 PM	Start	Execution	Int Pressure Accuracy - Back: SQL - Pressure Controlled Int - S: 25.0 psi - L: <= 1.2 psi
October 21, 2024 3:29:16 PM	End	Execution	Int Pressure Accuracy - Back: SQL - Pressure Controlled Int - S: 25.0 psi - L: <= 1.2 psi Run Count: 1
October 21, 2024 3:29:12 PM	Start	Execution	Detector Flow Accuracy - Front: FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% response

Page 2 of 2

Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CNI1481006

User Name: saengulhai.tanok		System ID: GC-6_CNI1481006	
Report Generated by Hardware: LAPTOP-CQ25XDMV		Print Date: October 22, 2024 9:27:09 AM	
2024_ALS_GC-6_CNI1481006_QDHW Transaction Log:			
Time	Transaction State	Activity Performed	Optional Information
October 21, 2024 3:29:50 PM	Auto	Data	Detector Flow Accuracy - Front: FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% response Manual Data Entry
October 21, 2024 3:26:53 PM	End	Execution	Detector Flow Accuracy - Front: FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% response Run Count: 1
October 21, 2024 3:29:54 PM	Start	Execution	Detector Flow Accuracy - Front: FID - Type: Oxidant - S: 400.0 mL/min - L: <= 10.0% response
October 21, 2024 3:27:10 PM	Auto	Data	Detector Flow Accuracy - Front: FID - Type: Oxidant - S: 400.0 mL/min - L: <= 10.0% response Manual Data Entry
October 21, 2024 3:27:13 PM	End	Execution	Detector Flow Accuracy - Front: FID - Type: Oxidant - S: 400.0 mL/min - L: <= 10.0% response Run Count: 1
October 21, 2024 3:29:11 PM	Start	Execution	Detector Flow Accuracy - Front: FID - Type: Making - S: 25.0 mL/min - L: <= 10.0% response
October 21, 2024 3:29:27 PM	Auto	Data	Detector Flow Accuracy - Front: FID - Type: Making - S: 25.0 mL/min - L: <= 10.0% response Manual Data Entry
October 21, 2024 3:29:29 PM	End	Execution	Detector Flow Accuracy - Front: FID - Type: Making - S: 25.0 mL/min - L: <= 10.0% response Run Count: 1
October 21, 2024 3:29:30 PM	Start	Execution	Detector Flow Accuracy - Back: FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% response
October 21, 2024 3:29:47 PM	Auto	Data	Detector Flow Accuracy - Back: FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% response Manual Data Entry
October 21, 2024 3:29:52 PM	End	Execution	Detector Flow Accuracy - Back: FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% response Run Count: 1

Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CNI1481006

User Name: slangshil@ark
Report Generated by Hostname: LAPTOP-CQ25K0MV
System ID: GC-6_CNI1461066
Print Date: October 21, 2024 9:27:05 AM

2024_ALS_GC-6_CNI1461066_OQHW Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 21, 2024 9:26:54 PM	Start	Execution	Detector Flow Accuracy - Back FID - Type: Detector - S: 400.0 mL/min - L: <= 10.0% support	None
October 21, 2024 9:30:07 PM	Auto	Data	Detector Flow Accuracy - Back FID - Type: Detector - S: 400.0 mL/min - L: <= 10.0% support	Manual Data Entry
October 21, 2024 9:30:08 PM	End	Execution	Detector Flow Accuracy - Back FID - Type: Detector - S: 400.0 mL/min - L: <= 10.0% support	Run Count: 1
October 21, 2024 9:30:11 PM	Start	Execution	Detector Flow Accuracy - Back FID - Type: Detector - S: 400.0 mL/min - L: <= 10.0% support	None
October 21, 2024 9:30:34 PM	Auto	Data	Detector Flow Accuracy - Back FID - Type: Detector - S: 400.0 mL/min - L: <= 10.0% support	Manual Data Entry
October 21, 2024 9:30:37 PM	End	Execution	Detector Flow Accuracy - Back FID - Type: Detector - S: 400.0 mL/min - L: <= 10.0% support	Run Count: 1
October 21, 2024 9:30:38 PM	Start	Execution	GC Oven Temperature Accuracy - 780.0 - Temperature: Oven - S: 230.0°C - L: <= +1.0 AND <= 1.0 % support in K	None
October 21, 2024 9:31:58 PM	Auto	Data	GC Oven Temperature Accuracy - 780.0 - Temperature: Oven - S: 230.0°C - L: <= +1.0 AND <= 1.0 % support in K	Manual Data Entry
October 21, 2024 9:31:59 PM	End	Execution	GC Oven Temperature Accuracy - 780.0 - Temperature: Oven - S: 230.0°C - L: <= +1.0 AND <= 1.0 % support in K	Run Count: 1

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Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CNI1461066

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User Name: slangshil@ark
Report Generated by Hostname: LAPTOP-CQ25K0MV
System ID: GC-6_CNI1461066
Print Date: October 22, 2024 9:27:05 AM

2024_ALS_GC-6_CNI1461066_OQHW Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 21, 2024 9:31:59 PM	Start	Execution	GC Oven Temperature Accuracy - 780.0 - Temperature: Oven - S: 230.0°C - L: <= +1.0 AND <= 1.0 % support in K	None
October 21, 2024 9:34:37 PM	Auto	Data	GC Oven Temperature Accuracy - 780.0 - Temperature: Oven - S: 230.0°C - L: <= +1.0 AND <= 1.0 % support in K	Manual Data Entry
October 21, 2024 9:34:39 PM	End	Execution	GC Oven Temperature Accuracy - 780.0 - Temperature: Oven - S: 230.0°C - L: <= +1.0 AND <= 1.0 % support in K	Run Count: 1
October 21, 2024 9:34:42 PM	Start	Execution	GC Oven Temperature Stability - 780.0 - Temperature: Oven - S: 230.0°C - L: <= +0.5°C	None
October 21, 2024 9:39:03 PM	Auto	Data	GC Oven Temperature Stability - 780.0 - Temperature: Oven - S: 230.0°C - L: <= +0.5°C	Manual Data Entry
October 21, 2024 9:39:07 PM	End	Execution	GC Oven Temperature Stability - 780.0 - Temperature: Oven - S: 230.0°C - L: <= +0.5°C	Run Count: 1
October 21, 2024 9:39:23 PM	Start	Execution	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	None
October 21, 2024 9:40:12 PM	Auto	AcqClosed	Session	None
October 22, 2024 8:55:47 AM	Auto	AcqRestarted	Session	None
October 22, 2024 8:55:50 AM	Auto	SessionMonitored	Session	None
October 22, 2024 8:56:02 AM	Start	Qualification	Session	OQ

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Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CNI1461066

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User Name: slangshil@ark
Report Generated by Hostname: LAPTOP-CQ25K0MV
System ID: GC-6_CNI1461066
Print Date: October 22, 2024 9:27:06 AM

2024_ALS_GC-6_CNI1461066_OQHW Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 22, 2024 8:56:02 AM	Start	Execution	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	None
October 22, 2024 8:56:46 AM	Auto	Data	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Data File Path: G:\Data\FrontFrom_FID1.D
October 22, 2024 8:57:20 AM	End	Execution	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Run Count: 1
October 22, 2024 8:57:26 AM	Start	Execution	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	None
October 22, 2024 8:58:01 AM	Auto	Data	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Data File Path: G:\Data\FrontFrom_FID1.D
October 22, 2024 8:58:37 AM	End	Execution	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Run Count: 1
October 22, 2024 8:58:40 AM	Start	Execution	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	None
October 22, 2024 8:58:46 AM	Auto	Data	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Data File Path: G:\Data\FrontFrom_FID1.D

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Date: October 22, 2024 9:27:06 AM
System ID: GC-6_CNI1461066

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User Name: slangshil@ark
Report Generated by Hostname: LAPTOP-CQ25K0MV
System ID: GC-6_CNI1461066
Print Date: October 22, 2024 9:27:06 AM

2024_ALS_GC-6_CNI1461066_OQHW Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 22, 2024 8:58:43 AM	Auto	Data	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Data File Path: G:\Data\FrontFrom_FID1.D
October 22, 2024 8:59:43 AM	Auto	Data	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Data File Path: G:\Data\FrontFrom_FID1.D
October 22, 2024 9:01:43 AM	Auto	Data	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Data File Path: G:\Data\FrontFrom_FID1.D
October 22, 2024 9:01:43 AM	Auto	Data	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Data File Path: G:\Data\FrontFrom_FID1.D
October 22, 2024 9:01:43 AM	Auto	Data	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Data File Path: G:\Data\FrontFrom_FID1.D
October 22, 2024 9:01:43 AM	Auto	Data	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Data File Path: G:\Data\FrontFrom_FID1.D
October 22, 2024 9:01:43 AM	Auto	Data	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Data File Path: G:\Data\FrontFrom_FID1.D
October 22, 2024 9:01:43 AM	Auto	Data	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Data File Path: G:\Data\FrontFrom_FID1.D
October 22, 2024 9:02:11 AM	End	Execution	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Run Count: 1
October 22, 2024 9:02:16 AM	Start	Execution	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	None
October 22, 2024 9:02:34 AM	Auto	Data	GC Solvent Flow - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Data File Path: G:\Data\FrontFrom_FID1.D

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Date: October 22, 2024 9:27:06 AM
System ID: GC-6_CNI1461066

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User Name: kareguthai.karak
Report Generated by: kareguthai.karak
System ID: GC-6_CN11451066
Print Date: October 22, 2024 9:27:05 AM

2024_ALS_GC-6_CN11451066_OQHW Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 22, 2024 9:02:34 AM	End	Execution	Signal to Noise - Injection Tower, Front SS, Back FID - Detector FID - L <= 300000	Run Count: 1
October 22, 2024 9:03:00 AM	Start	Execution	GC Scouting Run - Injection Tower, Back SS, Back FID - Part of System Preparation - No sample associated	None
October 22, 2024 9:03:31 AM	Audit	Data	GC Scouting Run - Injection Tower, Back SS, Back FID - GC - L (Area) <= 3.00% - L (Rel. Time) <= 1.00%	Data File Path: G:\Data\Back\Back_IP011.D FID08.ch
October 22, 2024 9:04:03 AM	End	Execution	GC Scouting Run - Injection Tower, Back SS, Back FID - Part of System Preparation - No sample associated	Run Count: 1
October 22, 2024 9:04:05 AM	Start	Execution	Noise and DHT - Back FID - Detector FID - L (Noise) <= 0.10 pA - L (DHT) <= 2.00 pA/Hz	None
October 22, 2024 9:05:56 AM	Audit	Data	Noise and DHT - Back FID - Detector FID - L (Noise) <= 0.10 pA - L (DHT) <= 2.00 pA/Hz	Data File Path: G:\Data\Back\Back_IP011.D FID08.ch
October 22, 2024 9:06:13 AM	End	Execution	Noise and DHT - Back FID - Detector FID - L (Noise) <= 0.10 pA - L (DHT) <= 2.00 pA/Hz	Run Count: 1
October 22, 2024 9:09:28 AM	Start	Execution	Injection Precision - Injection Tower, Back SS, Back FID - GC - L (Area) <= 3.00% - L (Rel. Time) <= 1.00%	None

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Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CN11451066

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User Name: kareguthai.karak
Report Generated by: kareguthai.karak
System ID: GC-6_CN11451066
Print Date: October 22, 2024 9:27:05 AM

2024_ALS_GC-6_CN11451066_OQHW Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 22, 2024 9:10:44 AM	Audit	Data	Injection Precision - Injection Tower, Back SS, Back FID - GC - L (Area) <= 3.00% - L (Rel. Time) <= 1.00%	Data File Path: G:\Data\Back\Back_IP011.D FID08.ch
October 22, 2024 9:10:44 AM	Audit	Data	Injection Precision - Injection Tower, Back SS, Back FID - GC - L (Area) <= 3.00% - L (Rel. Time) <= 1.00%	Data File Path: G:\Data\Back\Back_IP011.D FID08.ch
October 22, 2024 9:10:44 AM	Audit	Data	Injection Precision - Injection Tower, Back SS, Back FID - GC - L (Area) <= 3.00% - L (Rel. Time) <= 1.00%	Data File Path: G:\Data\Back\Back_IP011.D FID08.ch
October 22, 2024 9:10:44 AM	Audit	Data	Injection Precision - Injection Tower, Back SS, Back FID - GC - L (Area) <= 3.00% - L (Rel. Time) <= 1.00%	Data File Path: G:\Data\Back\Back_IP011.D FID08.ch
October 22, 2024 9:10:44 AM	Audit	Data	Injection Precision - Injection Tower, Back SS, Back FID - GC - L (Area) <= 3.00% - L (Rel. Time) <= 1.00%	Data File Path: G:\Data\Back\Back_IP011.D FID08.ch
October 22, 2024 9:11:15 AM	End	Execution	Injection Precision - Injection Tower, Back SS, Back FID - GC - L (Area) <= 3.00% - L (Rel. Time) <= 1.00%	Run Count: 1
October 22, 2024 9:11:23 AM	Start	Execution	Signal to Noise - Injection Tower, Back SS, Back FID - Detector FID - L <= 300000	None
October 22, 2024 9:11:45 AM	Audit	Data	Signal to Noise - Injection Tower, Back SS, Back FID - Detector FID - L <= 300000	Data File Path: G:\Data\Back\Back_IP011.D FID08.ch

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Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CN11451066

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User Name: kareguthai.karak
Report Generated by: kareguthai.karak
System ID: GC-6_CN11451066
Print Date: October 22, 2024 9:27:05 AM

2024_ALS_GC-6_CN11451066_OQHW Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 22, 2024 9:12:08 AM	End	Execution	Signal to Noise - Injection Tower, Back SS, Back FID - Detector FID - L <= 300000	Run Count: 1
October 22, 2024 9:12:15 AM	End	Qualification	Session	OQ
October 22, 2024 9:12:15 AM	Start	Reporting	Session	None
October 22, 2024 9:24:09 AM	Audit	Reporting	Session	Report Generated: Certificate
October 22, 2024 9:25:02 AM	Audit	Reporting	Session	Report Generated: Report

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Date: October 22, 2024 9:27:05 AM
System ID: GC-6_CN11451066

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

Cert.No.: 23TW168
Page.: 1 of 2

Certificate of Testing

Equipment : DO Meter
Manufacturer : YSI
Model : 5000-115V
Serial No. : 15E102796
ID No. : RYG_EN0032
Received Date : 21 July 2023
Test Date : 24 July 2023
Reference : 2307-0713DSC-1
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd.
Rayong Branch
616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng,
Rayong 21140, Thailand

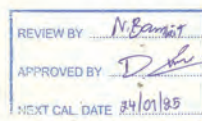
Laboratory Condition : Temperature (25 ± 5) °C
Humidity (50 ± 20) %
Test Procedure : In-house method : CP-CH9
by Comparison Technique with Azide Modification Method

Tested by : Walalak Sirithean

Approved by :
Approved Signatory

() Malee Butkruea
(x) Sathip Meangmai
() Warakorn Lemgagrakul

Issue Date : 26 July 2023





Cert.No.: 23TW168
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1) Burette	-	130BU10	23CG1172	22 Mar 2025
2) Balance	1126143764	140RC004	22MM50	20 Sep 2023

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate pentahydrate	Merck	AM1763316	100.2%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %

Dissolved Oxygen Probe No.: 15E100464

Titration Method (Azide Modification Method)	DO Meter Reading	Standard Deviation
(mg/L)	(mg/L)	(mg/L)
8.18	8.17	0.0055

This report was certified only for the instrument we tested. It is allowable to use for study the system efficiency, The environmental impact control and present to organization it may concerned. Intend to use for advertising and referral purpose is prohibited. This report may not be reproduced other in full, without written approval of the laboratory.

-o0o-

Saitip

a 1172155



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL: 0-2717-3000-29 FAX: 0-2719-9484



Cert. No.: 23LM125
Page.: 1 of 2

Certificate of Calibration

Equipment : DO Meter with Sensor
Manufacturer : YSI
Model : 5000-115V
Serial No. : 15E102796
ID No. : RYG_EN0032
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd.
Rayong Branch
616/10 Moo 5 T. Maenam Khu, A. Pluakdaeng,
Rayong 21140 Thailand
Location : TPA On Site Calibration Laboratory
Received Order : 25 July 2023
Calibrated Date : 27 July 2023
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V
Calibrated by : Preecha Hiahib
Approved by : *P. Hiahib*
Approved Signatory
() Pornthippa Tameyakul
() Malee Butkruea
(✓) Suwit Imjai
Issue Date : 31 July 2023

The Uncertainties are for a confidence probability of approximately 95%

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A 0053616



Equipment : DO Meter with Sensor
Condition As-Received : Used Item
Reference : 2307-0713DSC-2

Cert. No.: 23LM125
Page.: 2 of 2

Procedure Used :-

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

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Digital Thermometer	2188080	221285	TPA	21 Oct 2023

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

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

Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function : Temperature measurement.

This instrument was connected with temperature sensor, S/N.: 1228475367

Calibration Point	Immersion Depth	Standard Temperature	UUC* Reading	Error	Uncertainty	Coverage Factor
(°C)	(mm)	(°C)	(°C)	(°C)	(± °C)	k
20.00	100	20.011	19.91	-0.101 °	0.15	2.00

UUC* : Unit Under Calibration

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

-o0o-

41

a 1159515



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL: 0-2717-3000-29 FAX: 0-2719-9484



Certificate of Calibration

Cert. No.: 24TM1663
Page : 1 of 3

Equipment : Low Temp. Incubator
Manufacturer : Memmert
Model : IPP750
Serial No. : V818.0084
ID No. : RYG_EN0154
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd. Rayong Branch
616/10 Moo 5, T. Maenam Khu, A. Pluakdaeng,
Rayong 21140, Thailand
Location : BOD Room
Received Order : 01 November 2024
Calibration Date : 01 November 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V
Calibrated by : Krisda Malee
Approved by : *Kunchit*
Approved Signatory
() Ponpan Paipim
() Suwit Imjai
(✓) Kunchit Promprat
Issue Date : 07 November 2024

REVIEW BY *Thanitak*
APPROVED BY *D. Hiahib*
NEXT CAL DATE..... 01/05/26

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Equipment : Low Temp. Incubator
Condition As-Received : Used Item
Reference : 2411-0002OC-1
Procedure Used :-

Cert. No.: 24TM1663
Page : 2 of 3

Calibration were conducted using calibration procedure CP-OT02 based on TLAS G-20 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD).
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument Serial No. Cert. No. Traceability Due Date
1) Data Acquisition MY44073381 24LM73 TPA 18 May 2025

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

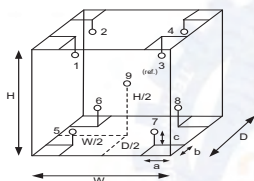
3. This certification is traceable to the International System of Unit.

Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close



Environment during calibration		
	Beginning	Finished
Temp. (°C)	24	25
REL.Humid. (%)	55	53
AC Supply (Volt)	220	221

Position :	Ref. Std. ID No.:
1	1RTD-2/1
2	1RTD-2/2
3	22-01RTD-03
4	1RTD-2/4
5	1RTD-2/5
6	1RTD-2/6
7	23-01RTD-07
8	1RTD-2/8
9 (ref.)	23-01RTD-09

Probe Installation Details :

Dimension of Chamber :

a = 10 cm
b = 10 cm
c = 10 cm
D = 0.60 m
W = 1.0 m
H = 1.2 m
Capacity = 0.72 m³



Equipment : Low Temp. Incubator
Condition As-Received : Used Item
Reference : 2411-0002OC-1
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Cert. No.: 24TM1663
Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor k
20.0	20.0	20.0	0.026	0.26	0.53	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (± °C)
	1	2	3	4	5	6	7	8	9 (ref.)	
20.0	20.071	19.915	20.273	20.179	19.977	19.782	20.056	20.026	20.033	0.30

Average* : The average of 30 values in each position.

Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.

UUC* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity .

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

-00-



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL.0-2717-3000-29 FAX.0-2719-9484



Certificate of Calibration

Cert.No.: 24CG3711
Page.: 1 of 2

Equipment : Burette

Capacity : 50 mL

Serial No. : -

ID. No. : RYG_EN0216

Manufacturer : Witeg

Made in : Germany

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

Ambient Temperature : (20 ± 2.5) °C

Relative Humidity : (50 ± 10) %

Barometric Pressure : 756 mmHg

Calibration Procedure : ASTM E 542 - 01

Calibrated by : Sa-ngeunkam Wongsas

Approved by :
Approved Signatory

(✓) Srisuda Khamtha
() Ponpan Paipim
() Unnopphol Harachai

Issue Date : 24 September 2024

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.



Equipment : Burette
Received Date : 19 September 2024
Condition As-Received : Used Item
Calibration Date : 24 September 2024
Reference : 2409-0756DSC-3

Cert.No.: 24CG3711
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

Instruments	Model	Serial No.	ID. No.	Certificate No.	Traceability	Due date
1) Balance	XP205	B134206712	140RC007	24MM316	TPA	15 July 2025
2) Data Logger	HL-20D	20683159	140EC012	23H2174	TPA	10 Oct 2024
3) Thermometer	-	1594592	140EC010	241175	TPA	20 Feb 2025

This certification is traceable to SI Unit

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

3. True value is converted to true volume at the standard temperature of 20 °C

Calibration result :

Nominal capacity (mL)	Reading (mL)	Uncertainty (± mL)	k Factor
10	10.0259	0.0082	2.00
20	20.0214	0.0085	2.00
30	30.0006	0.0089	2.00
40	40.0003	0.0094	2.00
50	49.9988	0.011	2.00

Remark mL = cm³

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

-00-

Certificate of Calibration

Equipment: SPECTROPHOTOMETER
Model: DR6000
Serial No. (or ID.): 1627845 (RYG_EN0037)
Manufacturer: HACH
Condition: In Condition

Calibration No.: C06230441
Issued Date: 19 September 2023
Job No.: WO-00005382
Page: 1 of 3

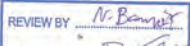
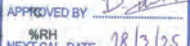
Customer: ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
618/10 Moo 5 T. Maenam Khu,
A. Pluakdaeng, Rayong 21140, Thailand.

Environment Condition: Temperature 23.9 °C ± 0.2
Humidity 65.3 %RH ± 1.4

Calibration Place: ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch) (Wet Chemistry)
618/10 Moo 5 T. Maenam Khu,
A. Pluakdaeng, Rayong 21140, Thailand.

Calibration By: Mr. Nattapat Rungreang
Calibration Date: 18 September 2023
The Method used: In house method, CAL-WI-24, base on ASTM E 275-08 and ASTM E 387-04
Traceability: This certificate is traceable to the CRM maintained by National Institute of Standards and Technology (NIST) through Stama Scientific Limited.

The standard for Wavelength Certificate No. 111583 and 111584
The standard for Photometric Certificate No. 9114984 and 111588
The standard for Stray light Certificate No. 111586 and 111585
The standard for Spectral resolution Certificate No. 111587

REVIEW BY: 
APPROVED BY: 
NEXT CAL. DATE: 18/7/25

(Mr. Nattapat Rungreang)
Person in charge

(Mr. Nitinun Srihawan)
Authorized signatory

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

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

These results may be affected by deviations from specified conditions. The results relate only to the items tested, calibrated or sampled. The report shall not be reproduced except in full without approval of DKSH Technology Limited.

บริษัท ดิเคช เทคโนโลยี จำกัด
2533 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10260
2533 Sukhumvit Road, Bangkok, Prathungkong, Bangkok 10260
Phone: +66 2839 7000 Email: info.calibration@dksh.com Website: www.dksh.com/scientific-thailand

Delivering Growth - in Asia and Beyond.

CAL-FM-C06-15: 12 Sep 2022

Calibration Results:
Without Adjustment

Wavelength Accuracy (nm), The spectral bandwidth of Std at 2 nm and UUC at 2 nm				
Standard Wavelength	Unit Under Calibration	Correction	Uncertainty	
418.61	418.3	0.31	0.13	
536.66	536.6	0.06	0.13	
637.88	638.3	-0.32	0.13	
748.48	748.7	-0.22	0.13	
807.03	807.4	-0.37	0.13	

Photometric Accuracy (Absorbance)				
Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
420 nm	0.0000	0.000	0.0000	0.0045
	0.2930	0.289	0.0040	0.0045
	0.5168	0.519	-0.0022	0.0045
	1.0298	1.029	0.0008	0.0045
440 nm	0.0000	0.000	0.0000	0.0045
	0.2867	0.283	0.0037	0.0045
	0.5073	0.509	-0.0017	0.0045
	1.0083	1.007	0.0013	0.0045
465 nm	0.0000	0.000	0.0000	0.0045
	0.2516	0.250	0.0016	0.0045
	0.4595	0.462	-0.0025	0.0045
	0.9334	0.933	0.0004	0.0045
546.1 nm	0.0000	0.000	0.0000	0.0045
	0.2461	0.245	0.0011	0.0045
	0.4652	0.466	-0.0008	0.0045
	0.9468	0.946	0.0008	0.0045
590 nm	0.0000	0.000	0.0000	0.0045
	0.2594	0.259	0.0004	0.0045
	0.5040	0.505	-0.0010	0.0045
	1.0032	1.002	0.0012	0.0045
635 nm	0.0000	0.000	0.0000	0.0045
	0.2579	0.257	0.0009	0.0045
	0.4971	0.497	0.0001	0.0045
	0.9720	0.971	0.0010	0.0045

บริษัท ดิเคช เทคโนโลยี จำกัด
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2533 Sukhumvit Road, Bangkok, Prathungkong, Bangkok 10260
Phone: +66 2839 7000 Email: info.calibration@dksh.com Website: www.dksh.com/scientific-thailand

Delivering Growth - in Asia and Beyond.

CAL-FM-C06-15: 12 Sep 2022

Calibration Results:
Without Adjustment

Photometric Accuracy (Absorbance)				
Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
235 nm	0.0000	0.000	0.0000	0.0080
	0.7355	0.737	-0.0015	0.0080
257 nm	0.0000	0.000	0.0000	0.0080
	0.8574	0.857	0.0004	0.0080
313 nm	0.0000	0.000	0.0000	0.0080
	0.2864	0.290	-0.0036	0.0080
350 nm	0.0000	0.000	0.0000	0.0080
	0.6374	0.637	0.0004	0.0080

Stray light *				
Standard: cut-off	UUC: Wavelength (nm)	UUC: Transmission (%T)	Absorbance (A)	
260.82 +/- 0.11 nm	260.6	1.3	1.886	
391.44 +/- 0.11 nm	391.4	1.3	1.886	

Spectral Resolution *				
Nominal Concentration 0.02 % w/v	Peak	Trough	Ratio	SBW
Standard Wavelength (nm)	268.66	266.89	1.38	2.00
UUC: Wavelength (nm)	268.2	266.1		
Std Absorbance (A)	0.4566	0.2780		
Absorbance (A)	0.413	0.300		

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

The End of Certificate

ใบตรวจสอบสภาพเครื่องวัดสิ่งแวดล้อม

เลขที่ใบงาน: WO-00005382

ชนิดเครื่องมือ: SPECTROPHOTOMETER รุ่น: DR6000

หมายเลขเครื่อง: 1627845

ตรวจสอบ (วัน)		รายการตรวจเช็ค	ตรวจสอบ (สัปดาห์)		หมายเหตุ
18 Sep 2023			18 Sep 2023		
ปกติ	ไม่ปกติ		ปกติ	ไม่ปกติ	
General					
☒	☐	1. ความสมบูรณ์เครื่อง	☒	☐	
☒	☐	2. ความสะอาด (ช่องใส่ตัวอย่าง, ภายใน-นอกเครื่อง)	☒	☐	
☒	☐	3. สวิตช์ ปิด – เปิด เครื่อง (On-Off Switch)	☒	☐	
☒	☐	4. ปุ่มกด (Keypad)	☒	☐	
☒	☐	5. หน้าจอ (Display, Screen Contrast)	☒	☐	
Spectrophotometer					
☐	☐	6. แบตเตอรี่ไฟฟ้า (Battery Backup) >= 2.5 VDC	☐	☐	
☐	☐	7. ควบคุมเลือกความยาวคลื่น (Wavelength Control)	☐	☐	
☒	☐	8. ความยาวคลื่น (Wavelength Check)	☒	☐	*
☒	☐	9. แหล่งกำเนิดแสง (UV < 3,000 hour)	☒	☐	9.2 Hours
☒	☐	10. แหล่งกำเนิดแสง (Visible < 5,000 hour)	☒	☐	741.5 Hours
☒	☐	11. ช่องรับหลายตัวอย่าง (Carousel Module)	☒	☐	
pH Meter and Conductivity Meter					
☐	☐	12. อิเล็กโทรด (Electrode and Connection Cable)	☐	☐	
☐	☐	13. ระดับสารละลายใน Electrode (Level KCl)	☐	☐	
☐	☐	14. ฝาปิดกันปลาย Electrode (Dust Protection Hood)	☐	☐	
☐	☐	15. ขาจับอิเล็กโทรด (Stand)	☐	☐	
Turbidimeter					
☐	☐	16. ค่าความขุ่นที่ต่ำสุด (No Sample)	☐	☐	
☐	☐	17. ระดับการส่องสว่างของแสง (>= 2.5 ไม่น้อย 3.0)	☐	☐	
Automatic titrator					
☐	☐	18. สัมภาพ Piston Burettes	☐	☐	
☐	☐	19. Function Rinsing and Dosing	☐	☐	
☐	☐	20. ระบบท่อน้ำยาและอุปกรณ์ประกอบ	☐	☐	

เพิ่มหน่วยความจำ: *656.1nm=656.1nm

*486.0nm=485.5nm

Mr. Nattapat Rungreang
Service Engineer



SARTORIUS

Certificate

of Calibration

REVIEW BY Thanyat
APPROVED BY D. J.
NEXT CAL DATE 02/03/2025

Model Number : MSE224S-100-DU
Description : Analytical Balance
Serial Number : 0026207039
ID No. : RYG_EN0002
Manufacturer : Sartorius
Certificate No. : 24BC10069
Issued Date : Friday, February 23, 2024
Reference No. : 229196
Page No. : 1 of 2

Customer Name : ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
816/10 Moo 5 T. Maenam Khu, A. Pluakdaeng, Rayong 21140, Thailand.

Calibrated Place : ALS Laboratory Group (Thailand) Co., Ltd. (Balance Room)
816/10 Moo 5 T. Maenam Khu, A. Pluakdaeng, Rayong 21140, Thailand.

Calibrated By : Mr. Chonchai Inthana
Calibration Date : Thursday, February 22, 2024
Calibration Procedure No. : This calibration was conducted by Using in-house calibration procedure number (NI-003) Based on UKAS LAB 14 : 2019

Metrological data :
Capacity : 220 g Readability : 0.0001 g
Ambient Conditions :
Temperature : 24.2 °C ± 5.0 °C
Humidity : 57.0 % RH ± 10.0 % RH
Pressure : ±

Reasons for calibration
☐ New Installation ☐ Service / Repair ☒ Re-calibration / Maintenance
Equipment Condition : ☒ Good Operate ☐ Fail

Measurement Method UKAS Publication Ref : Lab 14
The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM). The calibration certificate documents the traceability to National Standards, which realise the unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came from list of Sartorius Metrological Specifications.

Traceability:

Model Number	Description	Traceability	Certificate No.	Due Date
YCS011-522-00	Sartorius weight set 1mg - 5000g E2 YCS011-522-00	TCS	M2308197S	23-Aug-2025
MHB-382SD	Humidity/Balometer/Temp. Lubon MHB-382SD	DKSH	C19231845	23-Aug-2024

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

Chonchai Inthana



SOP FM 33.03 February 2022

Mr. Chonchai Inthana (Technical Manager)

SARTORIUS

Certificate of Calibration

Model Number : MSE224S-100-DU
Description : Analytical Balance
Serial Number : 0026207038
ID No. : RYG_EN0002
Manufacturer : Sartorius
Certificate No. : 24BC10069
Issued Date : Friday, February 23, 2024
Reference No. : 229196
Page No. : 2 of 2

Calibration Results : Without Adjustment

Repeatability		Eccentricity (Off-center loading error)	
The repeatability is the ability of a weighing instrument to display nearly identical readouts under identical test conditions when the same load within a measurement's range is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express repeatability quantitatively.		The off-center loading error is yielded by the difference between the readout of the load, i.e. 1/3 or 1/4 of maximum capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to OIML R78).	
Nominal Value : (Low Load)	20.0000 199.9999	Nominal value : 100 g	
20 g	20.0000 200.0000	Tolerance 0.0004 g	
Tolerance 0.0001 g	20.0001 200.0000		
	20.0000 199.9999		
	20.0001 200.0000		
Nominal Value : (High Load)	19.9999 200.0000		
200 g	20.0000 200.0000		
Tolerance 0.0001 g	20.0000 199.9999		
	19.9999 200.0001		
	19.9999 200.0000		
Standard Deviation	0.00007 0.00005		

Linearity				
The linearity, also called linearity error, describes the deviation of the characteristic curve of a weighing instrument from the linear slope.				
Tolerance 0.0002 g				
Nominal Value	Conventional Mass Value	Displayed Value	Deviation	Uncertainty
(g)	(g)	(g)	(g)	(g)
0.01	0.0100	0.0100	0.0000	0.00018
0.05	0.0500	0.0500	0.0000	0.00018
0.1	0.1000	0.1000	0.0000	0.00018
0.5	0.5000	0.5000	0.0000	0.00018
1	1.0000	1.0000	0.0000	0.00018
5	5.0000	5.0000	0.0000	0.00018
10	10.0000	10.0000	0.0000	0.00018
20	20.0000	20.0000	0.0000	0.00018
50	50.0000	49.9999	-0.0001	0.00019
100	100.0000	100.0000	0.0000	0.00023
200	200.0000	199.9999	-0.0001	0.00032
End of Report.				

SOP FM 33.03 February 2022



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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TEL.0-2717-3000-29 FAX.0-2719-9484



Certificate of Calibration

Cert. No.: 24TM634
Page : 1 of 3

Equipment : Hot Air Oven
Manufacturer : Memmert
Model : UF 110
Serial No. : B423.0853
ID No. : RYG_EN0213

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

Location : Oven Room

Received Order : 21 March 2024
Calibration Date : 21 - 22 March 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %

Calibrated by : Man Pattanapongpaiboon

Approved by : Man Pattanapongpaiboon
Approved Signatory

() Pornthipha Tameyakul
() Unnopphol Harachai
(x) Suwit Imjai

Issue Date : 23 March 2024

The Uncertainties are for a confidence probability of approximately 95%

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Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2403-0563OC-3
Procedure Used :-

Cert. No.: 24TM634
Page : 2 of 3

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD) and Thermocouple Type T.

The temperature scale used was based on ITS-90.

Condition of this result of calibration

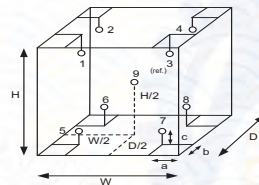
1. Reference standard instrument:-
Instrument Serial No. Cert. No. Traceable Due Date
1) Data Acquisition MY57013711 23LM115 TPA 11 Jul 2024

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

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

Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close



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

Environment during calibration		
	Beginning	Finished
Temp. (°C)	27	27
REL.Humid. (%)	59	59
AC Supply (Volt)	224	223

Ref. Std. ID No. @ Calibration Point		
Position :	(180) °C	(104) °C
1	18-18TC-01	18-18RTD-01
2	18-18TC-02	18-18RTD-02
3	18-18TC-03	18-18RTD-03
4	18-18TC-04	18-18RTD-04
5	18-18TC-05	18-18RTD-05
6	18-18TC-06	23-18RTD-06
7	18-18TC-07	18-18RTD-07
8	18-18TC-08	22-18RTD-08
9 (ref.)	18-18TC-09	18-18RTD-09



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2403-0563OC-3
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Cert. No.: 24TM634
Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor <i>k</i>
104.0	104.0	104.0	0.065	0.52	0.90	2
180.0	180.0	180.0	0.20	1.2	2.0	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (± °C)
	1	2	3	4	5	6	7	8	9 (ref.)	
104.0	104.169	103.506	103.898	103.712	103.772	103.730	104.289	103.805	103.798	0.42
180.0	180.701	179.239	179.935	179.999	180.127	180.138	180.895	179.313	180.211	1.1

Average* : The average of 30 values in each position.

Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.

UUC* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity .

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

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TEL.0-2717-3000-29 FAX.0-2719-9484



Certificate of Calibration

Cert. No.: 24TM635
Page : 1 of 3

Equipment : Water Bath
Manufacturer : Memmert
Model : WNB22
Serial No. : L513.0648
ID No. : RYG_EN0081

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

Received Order : 21 March 2024
Calibration Date : 21 March 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %

Calibrated by : Man Pattanapongpaiboon

Approved by :
Approved Signatory

() Pornthippa Tameyakul
() Unnopphol Harachai
(✓) Suwit Imjai

Issue Date : 23 March 2024

The Uncertainties are for a confidence probability of approximately 95%

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Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2403-0563OC-4
Procedure Used :-

Cert. No.: 24TM635
Page : 2 of 3

Calibration were conducted using in-house calibration procedure CP-OT04 Based on ASTM E715 according to direct measurement method with Data Acquisition which connected with Industrial Platinum Resistance Thermometer (IPRT).

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY57013711	23LM115	TPA	11 Jul 2024

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

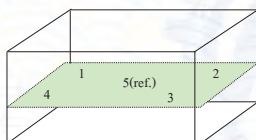
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Heat transfer medium used : Water

	Environmental		AC Voltage Supply
	(°C)	(%R.H.)	(Volt)
Beginning of Calibration	25	55	222
Finished of Calibration	25	57	223



Front

Position :	Ref. Std. ID No.:
1	4803988-001
2	4803988-002
3	4803988-003
4	4803988-004
5 (ref.)	4803988-005



Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2403-0563OC-4
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source

Cert. No.: 24TM635
Page : 3 of 3

Calibration point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Average* Standard Reading (°C)					Uncertainty (± °C)
			1	2	3	4	5 (ref.)	
85.0	85.0	85.0	84.428	84.424	84.489	84.507	84.477	0.18

Calibration point (°C)	Uniformity (°C)	Stability (± °C)	Coverage Factor <i>k</i>
85.0	0.19	0.11	2

Average* : The average of 30 values in each position.

Uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Stability : One-half of the greatest maximum difference of measured temperature at any one probe.

UUC* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity.

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

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Certificate of Calibration

Cert.No.: 24CH889
Page.: 1 of 2

Equipment : pH Meter
Manufacturer : Mettler Toledo
Model : SevenGo S2
Serial No. : C222171779
ID No. : RYG_FS0594
Condition As-Received: Used Item
Received Date : 26 July 2024
Calibration Date : 30 July 2024
Reference : 2407-0932DSC-1
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch
616/10 Moo 5, T.Maenam Khu,
A.Pluaekdaeng, Rayong 21140, Thailand

Ambient Temperature : (25 ± 2.5) °C
Relative Humidity : (50 ± 15) %
Calibration Procedure : In - house method :
- CP-CH5 by direct measurement with DC voltage
standard and direct measurement with
certified reference material (CRM)

Calibrated by : Warakorn Lernagatrakul

Approved by :
Approved Signatory

() Unnopphol Harachai
() Ponpan Paipim
(✓) Saithip Meangmai

Issue Date : 30 July 2024

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Cert.No.: 24CH889
Page.: 2 of 2

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	23E2802	27 Aug 2024

- This Certification is traceable to SI Through Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials : The measurement results are traceable to SI through CPA chem Ltd.,
ANSI-ASQ National Accreditation Board, Accredited No. AR-1635

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.008	CPA chem	970851	25 Apr 2026
pH 6.986	CPA chem	970852	25 Apr 2025
pH 9.997	CPA chem	970853	25 Apr 2025

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

Calibration Results

Function : mV Measurement

Performing standard curve by Document Process Calibrator at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement	Coverage factor
	pH	mV	mV	pH	(±mV)	k
pH Meter S/N.: C222171779	4.00	177.48	177	4.00	0.58	2.00
	7.00	0.00	0	7.00	0.58	2.00
	10.00	-177.48	-178	10.00	0.58	2.00

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor k
pH Electrode S/N.: 3184175	4.008	4.01	172	0.0071	2.00
	6.986	6.99	-2	0.0099	2.00
	9.997	10.00	-174	0.0092	2.00

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

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Certificate of Calibration

Cert. No.: 24LM120
Page.: 1 of 2

Equipment : pH Meter with Sensor
Manufacturer : Mettler Toledo
Model : Seve2Go S2
Serial No. : C222171779
ID No. : RYG_FS0594
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch
616/10 Moo 5, T.Maenam Khu,
A.Pluaekdaeng, Rayong 21140, Thailand

Location : TPA On Site Calibration Laboratory

Received Order : 26 July 2024
Calibrated Date : 30 July 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V

Calibrated by : Warakorn Lernagatrakul

Approved by :
Approved Signatory

() Ponpan Paipim
() Suwit Imjai
(✓) Kunchit Promprat

Issue Date : 01 August 2024

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Equipment : pH Meter with Sensor
Condition As-Received : Used Item
Reference : 2407-0932DSC-3

Cert. No.: 24LM120
Page.: 2 of 2

Procedure Used :-

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

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Digital Thermometer	3240076	24I317	TPA	21 Mar 2025

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

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

Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function : Temperature measurement.

This instrument was connected with temperature sensor, S/N.: 3293237

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
25.0	100	25.003	25.1	0.097	0.16	2.00
30.0	100	30.004	30.2	0.196	0.16	2.00
40.0	100	40.001	40.2	0.199	0.16	2.00
50.0	100	50.003	50.2	0.197	0.16	2.00

UUC* : Unit Under Calibration

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

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Certificate of Calibration

Cert.No.: 24CH1079
Page.: 1 of 2

Equipment : pH Meter
Manufacturer : Mettler Toledo
Model : Seven2Go S2
Serial No. : C232588424
ID No. : RYG_FS0605
Condition As-Received: Used Item
Received Date : 29 August 2024
Calibration Date : 30 August 2024
Reference : 2408-0988DSC-1
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5, T.Maenam Khu,
A.Pluaekdaeng, Rayong 21140, Thailand

Ambient Temperature : (25 ± 2.5) °C
Relative Humidity : (50 ± 15) %
Calibration Procedure : In - house method :
- CP-CH5 by direct measurement with DC voltage
standard and direct measurement with
certified reference material (CRM)

Calibrated by : Warakorn Lerngagrakul
Approved by :
() Unnophol Harachai
() Ponpan Paipim
(✓) Salthip Meangmai
Issue Date : 2 September 2024

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Cert.No.: 24CH1079
Page.: 2 of 2

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	58440003	130RC120	23E3607	13 Nov 2024

- This Certification is traceable to SI Through Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials : The measurement results are traceable to SI through Hach Lenge GmbH Ltd.,
Deutsche Akkreditierungsstelle, Accredited No.D-RM-15184-01-00
: The measurement results are traceable to SI through CPA chem Ltd.,
ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.006	Hach Lenge GmbH	C03146	23 Feb 2026
pH 7.000	Hach Lenge GmbH	C03020	13 Dec 2024
pH 9.997	CPA chem	970853	25 Apr 2025

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

Calibration Results

Function : mV Measurement

Performing standard curve by Document Process Calibrator at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement	Coverage factor
	pH	mV	mV	pH	(± mV)	k
pH Meter S/N.: C232588424	4.00	177.48	178	4.00	0.58	2.00
	7.00	0.00	0	7.00	0.58	2.00
	10.00	-177.48	-177	10.00	0.58	2.00

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor k
pH Electrode S/N.: 2465869	4.006	4.01	168	0.0084	2.00
	7.000	7.00	-9	0.0092	2.05
	9.997	10.00	-181	0.0092	2.00

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

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Certificate of Calibration

Cert. No.: 24LM139
Page.: 1 of 2

Equipment : pH Meter with Sensor
Manufacturer : Mettler Toledo
Model : Seven2Go S2
Serial No. : C232588424
ID No. : RYG_FS0605
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5, T.Maenam Khu,
A.Pluaekdaeng,
Rayong 21140, Thailand
Location : TPA On Site Calibration Laboratory

Received Order : 29 August 2024
Calibrated Date : 30 August 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V

Calibrated by : Warakorn Lerngagrakul
Approved by :
() Ponpan Paipim
() Suwit Imjai
(✓) Kunchit Promprat
Issue Date : 02 September 2024

The Uncertainties are for a confidence probability of approximately 95%

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Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Equipment : pH Meter with Sensor
Condition As-Received : Used Item
Reference : 2408-0988DSC-2
Procedure Used :-

Cert. No.: 24LM139
Page.: 2 of 2

Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer (IPRT) into Temperature Bath.
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Digital Thermometer	20410013	24I851	TPA	08 Aug 2025

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

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

Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration : (*) Without Adjustment

Function : Temperature measurement.

This instrument was connected with temperature sensor, S/N.: 2465869

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
25.0	100	25.003	25.3	0.297	0.16	2.00
30.0	100	30.002	30.3	0.298	0.16	2.00
40.0	100	40.002	40.4	0.398	0.16	2.00
50.0	100	50.003	50.4	0.397	0.16	2.00

UUC* : Unit Under Calibration

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

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL.0-2717-3000-29 FAX.0-2719-9484



Certificate of Calibration

Cert. No.: 24TM632
Page : 1 of 3

Equipment : Hot Air Oven
Manufacturer : Memmert
Model : UFE 500
Serial No. : G511.1572
ID No. : RYG_EN0010

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

Received Order : 21 March 2024
Calibration Date : 21 March 2024
Ambient Temperature : $(26 \pm 10) ^\circ\text{C}$
Relative Humidity : $(50 \pm 30) \%$

Calibrated by : Man Pattanapongpaiboon

Approved by :
() Pornthippa Tameyakul
() Unnopphol Harachai
(x) Suwit Imjai

Approved Signatory

Issue Date : 22 March 2024

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2403-0563OC-1
Procedure Used :-

Cert. No.: 24TM632
Page : 2 of 3

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD) and Thermocouple Type T.

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY57013711	23LM115	TPA	11 Jul 2024

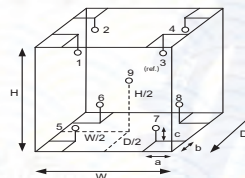
2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certificate is traceable to the International System of Unit.

Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration : (*) Without Adjustment
Function of UUC* : Temperature Source

Fresh air setting : Close

Environment during calibration		
	Beginning	Finished
Temp. (°C)	27	27
REL.Humid. (%)	57	59
AC Supply (Volt)	222	224



Probe Installation Details :

a = 5.0 cm
b = 5.0 cm
c = 5.0 cm

Dimension of Chamber :

D = 0.40 m
W = 0.56 m
H = 0.48 m
Capacity = 0.11 m³

Ref. Std. ID No.: @ Calibration Point		
Position :	(180) °C	(104) °C
1	18-18TC-01	18-18RTD-01
2	18-18TC-02	18-18RTD-02
3	18-18TC-03	18-18RTD-03
4	18-18TC-04	18-18RTD-04
5	18-18TC-05	18-18RTD-05
6	18-18TC-06	23-18RTD-06
7	18-18TC-07	18-18RTD-07
8	18-18TC-08	22-18RTD-08
9 (ref.)	18-18TC-09	18-18RTD-09



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2403-0563OC-1
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Cert. No.: 24TM632
Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor k
104.0	104.0	104.0	0.051	0.59	0.62	2
180.0	180.0	180.0	0.15	1.3	1.7	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (± °C)
	1	2	3	4	5	6	7	8	9 (ref.)	
104.0	103.921	103.786	103.757	103.759	103.950	103.817	104.213	103.672	103.673	0.42
180.0	179.614	179.270	179.145	179.599	180.001	180.423	180.293	180.629	179.429	1.1

Average* : The average of 30 values in each position.

Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.

UUC* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity .

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

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Certificate of Calibration

Represent to Certificate of Calibration No. C29240007

Equipment: Block Digestion Unit
Model: KT-20s
Serial No. (or ID.): 5720210009/5770200073
Manufacturer: Gerhardt
Condition: In Condition

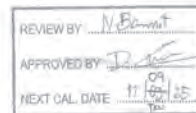
Certificate No.: C29240011
Issued Date: 22 March 2024
Job No: WO-00020429
Page: 1 of 4
Digestion Block: 20 holes.

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

Environment Condition: Temperature: 25 °C ± 0.7 °C
Humidity: 54 %RH ± 4.1 %RH
Voltage: 225 VAC ± 1.7 VAC

Calibration Place: ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
(Wet Chemistry Lab)
616/10 Moo 5 T.Maenam Khu, A.Pluakdaeng, Rayong 21140, Thailand.

Calibration By: Mr. Thanathorn Phunook
Calibration Date: 11 March 2024
The Method used: In house method, base on by comparison with standard
Traceability: This certificate is traceable to the SI Units maintained by National Institute of Metrology (NIMT), Thailand through N.M. Technical Center Laboratory (NTL).
Certificate No.: TC22/0080



(Mr. Thanathorn Phunook)
Person in charge

(Mr. Udon Srichana)
Authorized signatory

This certificate is issued in accordance with the requirements of the International System of Units (SI), and is subject to the conditions of measurement and calibration services provided by the company.

The measurement uncertainty stated in this certificate is based on the expanded uncertainty (k=2) as determined from the significant uncertainty associated with the measurement process (NIST) and provides a level of confidence of approximately 95%.

These results may be affected by deviations from specified conditions. The results relate only to the items tested, calibrated or sampled. The report shall not be reproduced except in full without approval of DKSH Technology Limited.

DKSH Technology Limited
2533 Maenam Road, Rayong, Thailand 21140
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Website: www.dksh.com

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CAL-FM (29-07) 23.04.2022

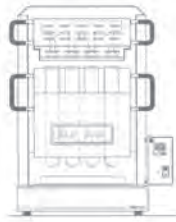
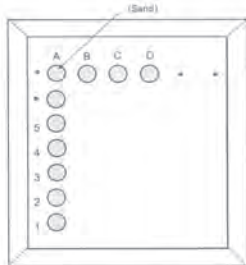


Fig. 1: Front view



Location of standard

Fig. 2: Digestion block

Definitions

Indicating Temperature: The average reading of indicating device which forms the integral part of the Digestion block.

Measured Temperature: The average reading of working standard at any position or location.

Calibration Results:

Pre Calibration

Locations	Desired (°C)	Setting (°C)	Indicating (°C)	Measured Temperature (°C)	Correction of UUC (°C)	Uncertainty (± °C)
A1	380	380	380	401.5	21.5	1.5
A2				401.2	21.2	1.5
A3				399.1	19.1	1.5
A4				397.8	17.8	1.5
A5				395.1	15.1	1.5
B1				396.6	16.6	1.5
B2				396.1	16.1	1.5
B3				392.9	12.9	1.5
B4				391.6	11.6	1.5
B5				390.7	10.7	1.5
C1				386.3	15.3	1.5
C2				386.6	15.6	1.5
C3				382.8	12.8	1.5
C4				381.7	11.7	1.5
C5				380.3	10.3	1.5
D1				397.6	17.6	1.5
D2				386.6	16.6	1.5
D3				395.0	15.0	1.5
D4				384.2	14.2	1.5
D5				383.6	13.6	1.5

Calibration Results:

Without adjustment

Locations	Desired (°C)	Setting (°C)	Indicating (°C)	Measured Temperature (°C)	Correction of UUC (°C)	Uncertainty (± °C)
A1	380	380	380	382.5	17.5	1.5
A2				382.4	17.4	1.5
A3				382.1	17.1	1.5
A4				379.7	14.7	1.5
A5				378.3	13.3	1.5
B1				380.1	15.1	1.5
B2				380.1	15.1	1.5
B3				378.5	13.5	1.5
B4				378.3	13.3	1.5
B5				379.1	14.1	1.5
C1				380.1	15.1	1.5
C2				380.1	15.1	1.5
C3				378.9	13.9	1.5
C4				378.2	13.2	1.5
C5				377.3	12.3	1.5
D1				380.5	15.5	1.5
D2				380.6	15.6	1.5
D3				378.1	13.1	1.5
D4				378.7	13.7	1.5
D5				377.7	12.7	1.5

The End of Certificate

ใบตรวจสอบสภาพเครื่องควบคุมอุณหภูมิ

เลขที่ใบงาน: WO-00020429

ชนิดเครื่อง: Block Digestion Unit

รุ่น: KT-20s

หมายเลขเครื่อง: 5720210009/5770200073

ตรวจสอบ (วัน)	รายการตรวจเช็ค	ตรวจสอบ (ผู้)	หมายเหตุ
11 Mar 2024		11 Mar 2024	
ปกติ	ไม่ปกติ	ปกติ	ไม่ปกติ
General			
☒	☐	1. สายไฟ	☒
☒	☐	2. การทำงาน Main Switch	☒
☒	☐	3. การทำงาน Selector Key	☒
☒	☐	4. การแสดงผล Display	☒
☒	☐	5. สภาพ Hole	☒
☐	☒	6. สภาพฝาปิด	☐
☒	☐	7. สภาพตัวเครื่อง	☒
☒	☐	8. สภาพแวดล้อม ณ สถานที่ตั้งเครื่อง	☒

ชื่อคนทำ

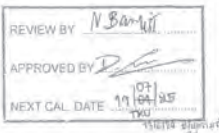
Mr. Trianathorn Phonook
Service Engineer



Cert.No.: 24CH96
Page.: 1 of 3

Certificate of Calibration

Equipment : pH Meter
Manufacturer : Mettler Toledo
Model : SevenCompact S220
Serial No. : C104059460
ID No. : RYG_EN0183
Condition As-Received: Used Item
Received Date : 18 January 2024
Calibration Date : 19 January 2024
Reference : 2401-0579DSC-2
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)
616/10 Moo 5, T.Maenam Khu,
A.Phuakdaeng, Rayong 21140, Thailand



Ambient Temperature : $(25 \pm 2.5) ^\circ\text{C}$
Relative Humidity : $(50 \pm 15) \%$
Calibration Procedure : In-house method
- CP-CH5 by direct measurement with standard voltage calibrator and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with temperature standard

Calibrated by : Warakorn Lemgagrakul

Approved by :

(☒) Sallhip Maangmai
(☐) Warakorn Lemgagrakul
(☐) Porpan Palpim

Issue Date : 24 January 2024

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

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A 0062854



Cert.No.: 24CH96
Page.: 2 of 3

Condition of this calibration result

- Reference Standard Instrument
- Instrument

Serial No.	ID No.	Cert. No.	Due Date
54030049	130RC116	23E2802	27 Aug 2024
4982054	110RC044	23I908	26 July 2024

This certification is traceable to the International System of Unit maintained through:-
- Technology Promotion Association (Thailand-Japan)

- Certified Reference Materials : The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.008	CPA chem	840102	27 Nov 2025
pH 6.986	CPA chem	840104	02 Nov 2024
pH 9.997	CPA chem	840106	02 Nov 2024

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

Calibration Results

Function : mV Measurement

Performing standard curve by Fluke at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (±mV)	Coverage factor k
			mV	pH		
pH Meter S/N : C104059460	4.000	177.48	177.4	4.000	0.058	2.00
	7.000	0.00	0.0	7.000	0.058	2.00
	10.000	-177.48	-177.5	10.000	0.058	2.00

A 1198287



Cert.No.: 24CH96
Page.: 3 of 3

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4.01,7.00,10.01)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor k
pH Electrode S/N : 3225367	4.008	4.013	176.0	0.0054	2.07
	6.986	6.983	2.2	0.0084	2.00
	9.997	9.995	-174.1	0.0065	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe:

- Model : InLab6Expert Pro-ISM

- Serial No. : 3225367

Dimension of probe

- Length : 120 mm.

- Diameter : 12 mm.

- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
25.0	25.001	25.2	0.199	0.13	2.00

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

-060-

A 1198286



Certificate of Calibration

Certificate No.: 24E289
Page : 1 of 2

Equipment : pH Meter
Manufacturer : Mettler Toledo
Model : SevenCompact S220
Serial No. : C104059460
ID No. : RYG_EN0183

Condition As-Received: Used Item
Received Date : 18 January 2024
Calibration Date : 23 January 2024

Reference : 2401-0579DSC
Ambient Temperature : $(23 \pm 2) ^\circ\text{C}$
Relative Humidity : $(50 \pm 10) \%$

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

Procedure used : Calibration were conducted using calibration procedure No. CP-E17 According to EURAMET cg-16.

Condition of this result of calibration

- Reference standards instruments:

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Multi-Product Calibrator	5500A	6315011	E209300035	29 May 2024

- This result of calibration was made on request at the point specified by customer.

- The certificate is valid only to the item calibrated on date and place of calibration.

- This Certification is traceable to the International System of Unit maintained through:-

-NA Caltechologies Co., Ltd., ANAB Accredited No. Calibration AC-2838

Calibrated by : Wudkarnporn Wongchabkum
Issue Date : 24 January 2024

Approved Signatory :

(☒) Piyasinee Pitsatrapal
(☒) Nuntawat Khunthaisai
(☐) Pongasam Boonyadorn

A 0333296



Cert. No.: 24E289

Page: 2 of 2

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

Function: DC voltage measurement

Range:

2000

mV

Standard Value	UUC* Reading	Error	Uncertainty
(mV)	(mV)	(mV)	($\pm$ μ V)
-200.0000	-200.0	0.0	68
-150.0000	-150.0	0.0	65
-100.0000	-100.0	0.0	63
-50.0000	-50.0	0.0	61
0.0000	0.0	0.0	58
50.0000	50.0	0.0	61
100.0000	99.9	-0.1	63
150.0000	149.9	-0.1	65
200.0000	199.9	-0.1	68

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

UUC* = Unit Under Calibration.

-000-

1198963

ภาคผนวก จ

สำเนาหนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

๗๕) นายประเสริฐ สุระคัมภีร์
๗๖) นายบุญล จันทะนิมิต
๗๗) นายพิรพงษ์ ทองอุณปรีดา
๗๘) นายณัฐพล ทองบุ
๗๙) นายอติวัฒน์ ม่วงเพชร
๘๐) นายเจตคุรรักษ์ ปิณฑะมะ
๘๑) นายภูษิต สหายธรรม
๘๒) นายพิชัย บุญยงค์
๘๓) นายภาณุพงศ์ โธมวงศ์
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๙๒) นางสาวพิมพ์ขวัญ มีมากุล
๙๓) นางสาวเพ็ญรัตน์ สิงห์สมบุญ
๙๔) นางสาวชญาพร นพรมจันทร์
๙๕) นายกรัตน์ ทรัพย์
๙๖) นายจักริน วัฒนวิธา
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เอกสารแนบท้ายหนังสือรับข้ออาชญากรรมทะเบียนห้องปฏิบัติการวิเคราะห์เอกสาร
บริษัท เอนเนลเอส แลบบอริทรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๒๐๔
ที่ อก ๐๓๑๐(๑)/ ๑๖ ๑๖ ๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๑๙๔ รายการ
น้ำเสีย จำนวน 60 รายการ

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

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/ Mass Spectrometric Method ⁽⁴⁾
22	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
23	2,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
24	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
25	2,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
26	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
27	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
28	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
29	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
30	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
31	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
32	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
33	Formaldehyde	Distillation, Colorimetric Method ⁽³⁾
34	Free Chlorine	1) DPD Ferrous Titrimetric Method ⁽³⁾ 2) DPD Colorimetric Method ⁽⁴⁾
35	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
36	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
37	Hexavalent Chromium	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...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
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/ Mass Spectrometric Method ⁽⁴⁾
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 ⁽³⁾
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 Phosphorous	Digestion, Colorimetric Method ⁽⁴⁾
57	Total Suspended Solids	Dried from 103-105 °C ⁽⁴⁾
58	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
59	Trivalent Chromium	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ⁽⁴⁾
60	Zinc	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁴⁾

น้ำใต้ดิน...

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⁾
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⁾

18 Bis(2-ethylhexyl)phthalate...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
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)	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ⁽⁴⁾
35	Chromium (VI)	Colorimetric Method ⁽⁴⁾

36 Chrysene...

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

ลำดับที่	สารเคมี	วิธีวิเคราะห์
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⁾
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...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
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) Digestion, Cold Vapor Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
84	Methanol	Purge and Trap, 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...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
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⁾
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, Chloroform Extraction Method ⁽⁴⁾ 2) Distillation, Direct Photometric Method ⁽⁴⁾ 3) 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 ₉ -C ₁₄)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(4,25)

110 TPH (C₁₀-C₁₉)...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
110	TPH (C ₁₀ -C ₁₆)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(9,22)
111	TPH (C ₁₁ -C ₂₅)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(9,22)
112	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
113	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
114	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
115	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
118	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
119	Vanadium	1) Digestion, Inductively Coupled Plasma Method ⁽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⁾

จากผลเสีย

จากผลเสีย (ปล่อยรวม) จำนวน 28 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
2	Arsenic	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
3	Beryllium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
4	Cadmium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
5	Carbon Monoxide	1) Instrumental Analyzer Method ⁽⁵⁾ 2) Sampling Bag Non-Dispersive Infrared Method ⁽⁵⁾
6	Chlorine	1) Adsorption Sampling, Ion Chromatographic Method ⁽⁵⁾ 2) Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
7	Chromium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
8	Cobalt	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
9	Copper	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
10	Cresol	Adsorption Sampling, Gas Chromatographic Method ⁽⁵⁾
11	Dioxins	Isokinetic Sampling ⁽⁵⁾
12	Hydrogen Chloride	1) Adsorption Sampling, Ion Chromatographic Method ⁽⁵⁾ 2) Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
13	Hydrogen Fluoride	1) Adsorption Sampling, Ion Chromatographic Method ⁽⁵⁾ 2) Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ⁽⁵⁾

15 Lead...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
15	Lead	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
16	Manganese	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
17	Mercury	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽⁵⁾
18	Nickel	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
19	Opacity	Ringelmann's Method ⁽⁵⁾
20	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ⁽⁵⁾ 2) Absorption Sampling, Alkaline Permanganate/Colorimetric Method ⁽⁵⁾ 3) Instrumental Analyzer Method ⁽⁵⁾
21	Selenium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
22	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ⁽⁵⁾ 2) Instrumental Analyzer Method ⁽⁵⁾
23	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ⁽⁵⁾
24	Tellurium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
25	Tin	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
26	Total Suspended Particulate	1) Isokinetic Sampling, Gravimetric Method ⁽⁵⁾ 2) Paired Train, Isokinetic Sampling, Gravimetric Method ⁽⁵⁾

27 Vanadium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Vanadium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
28	Xylene	Adsorption Sampling, Gas Chromatographic Method ⁽⁵⁾

สิ่งปลูกสร้างหรือวัตถุที่ไม่ใช่พื้นผิว จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(9,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,26)
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)

5 Beryllium...

ลำดับที่	สารพิษ	วิธีวิเคราะห์
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
9	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1.6.16,19) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1.6.17,19) 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7.13,19) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7.17,19)

10 Chromium (VI)...

ลำดับที่	สารพิษ	วิธีวิเคราะห์
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^(1.6.19) 2) Alkaline Digestion, Colorimetric Method ^(8.49)
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24)

2) Soxhlet...

ลำดับที่	สารพิษ	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26) 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)
20	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)

22 Mercury...

ลำดับที่	สารพิษ	วิธีวิเคราะห์
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(1.6.20) 2) Waste Extraction, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^(1.6.20) 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽²⁸⁾ 4) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽²⁹⁾ 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ⁽²¹⁾
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)
25	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
26	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
27	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)

- 2-Chlorobiphenyl...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	- 2-Chlorobiphenyl - 2,3-Dichlorobiphenyl - 2,2',5'-Trichlorobiphenyl - 2,4',5'-Trichlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',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 Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26) Electrometric Method ^(25,25) 4) Digestion, Inductively Coupled Plasma Method ^(1,6,16) 5) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,17) 6) Digestion, Inductively Coupled Plasma Method ^(7,16) 7) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
29	pH	
30	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)

31 Silver...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
35	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)

31...

สืบ จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
2	Acetone	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,25) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(13,23)
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
4	Anthracene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
8	Barium	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
9	Benz(a)anthracene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
10	Benzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,25)

11 Benzol(b)fluoranthene

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Benzol(b)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
12	Benzol(k)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
13	Benzoic acid	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
14	Benzol(a)pyrene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
15	Benzol(g,h)perylene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
17	Bis(2-chloroethyl)ether	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
18	Bis(2-ethylhexyl)phthalate	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,25)
20	Bromoform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,25)
21	Butanol	Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(13,23)
22	Butyl Benzyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)

23 Cadmium...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
24	Carbazole	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
28	p-Chloroaniline	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
32	2-Chlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7,8,16,19) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7,8,17,19)
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^(8,19)

36 Chrysene...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
36	Chrysene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
37	Cyanide	Extraction, Distillation, Colorimetric Method ^(27,28,29)
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
39	DDD	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
40	DDE	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
41	DDT	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
42	Dibenz(a,h)anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
43	Di-n-Butyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
47	3,3-Dichlorobenzidine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)

49 1,2-Dichloroethane...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
53	2,4-Dichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
58	Diethyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
59	2,4-Dimethylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
60	2,4-Dinitrophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
61	2,4-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
62	2,6-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

63 Di-n-Octyl Phthalate...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
63	Di-n-Octyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
67	Fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
68	Fluorene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
70	Heptachlor epoxide	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
73	n-Hexane	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23) 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ⁽¹³⁾

73 n-Hexane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
74	α -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
75	β -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
76	γ -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
77	Hexachlorocyclopentadiene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
78	Hexachloroethane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
79	Indeno(1,2,3-cd)pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
80	Isophorone	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
81	Lead	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽²⁰⁾ 2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry ⁽²¹⁾ 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽²⁰⁾

85 Methanol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(11,23) 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^(11,23)
85	Methoxychlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(11,23)
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(11,23)
88	2-methylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
89	2-Methylnaphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(11,23)
91	Naphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
93	Nitrobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
94	N-Nitrosodiphenylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
95	N-Nitrosodi-n-propylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

96 Polychlorinated biphenyls (PCBs)

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',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',5,5',6'-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6'-Nonachlorobiphenyl	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
97	Pentachlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
98	Phenanthrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

99 Phenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
99	Phenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
100	Pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
101	Selenium	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
102	Silver	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
103	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(11,23)
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(11,23)
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(11,23)
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(11,23)
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
108	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(11,23)
109	TPH (C ₈ -C ₁₅)	1) Automate Extraction, Gas Chromatographic Method ^(11,22) 2) Solvent Extraction, Gas Chromatographic Method ^(12,22) 3) Ultrasonic Extraction, Gas Chromatographic Method ^(22,3)
110	TPH (C ₁₅ -C ₃₅)	1) Automate Extraction, Gas Chromatographic Method ^(11,22) 2) Solvent Extraction, Gas Chromatographic Method ^(12,22) 3) Ultrasonic Extraction, Gas Chromatographic Method ^(22,3)
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(11,23)
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(11,23)
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(11,23)
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(11,23)

115 2,4,5-Trichlorophenol...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
115	2,4,5-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,16) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,20)
116	2,4,6-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,20) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,20)
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,21)
118	Vanadium	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
119	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,21)
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,21)
121	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,21)
122	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,21)
123	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,21)
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,21)
125	Zinc	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)

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ที่ ๒๓ ๐๓๑๐๒/ ๔๑๒๑

กรมโรงงานอุตสาหกรรม
ถนนพหลโยธินที่ ๒ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๕ เมษายน ๒๕๖๗

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท แอลแอล แลบราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอขึ้นรายการของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๔ มีนาคม ๒๕๖๗

พจนาคำขออ้างถึง บริษัท แอลแอล แลบราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔-๙-๐๑๔๓๓-๑๐๔ ขอพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ
เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓ ราย

๑) นางสาวพรณิศา หุ่นคง ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๒๕

๒) นายกำชัย สุทธะ ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๒๓

๓) นางสาวศุภรดา ปิ่นมูรา ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๓๘

๒. ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๑๒ ราย

๑) นางสาวฐานิดา กสินเขียว ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๔๒

๒) นางสาวกัญญ์วิมล สายคำ ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๔๓

๓) นางสาวณัฐนันทน์ กิตติวงค์ ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๔๔

๔) นายธนากร วงษาเคน ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๔๕

๕) นายฤทธิพล ปัญญาวัฒน์ ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๔๖

๖) นายณัฐกร หาราชา ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๔๗

๗) นายวิรัตน์ ผ่องใสสวน ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๔๘

๘) นายณัฐพงศ์ โสภา ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๔๙

๙) นายดิเรกพร ปานเพ็ง ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๕๐

๑๐) นายณัฐพล ชุ่มชื่น ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๕๑

๑๑) นายธนา สุภาพบุรินทร์ ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๕๒

๑๒) นายณรรธ นันทวงษ์ชา ทะเบียนเลขที่ ๖-๒๐๔-๙-๐๑๕๓

อนึ่ง หนังสือฉบับนี้

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒ กันยายน ๒๕๖๔

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



กองวิจัยและเตือนภัยมลพิษโรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๔๔
ไปรษณีย์อิเล็กทรอนิกส์ sarabang@dw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ อก ๐๓๓๐(๑)/ ๑๒๓๖ ๘

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๑๔ ธันวาคม ๒๕๖๓

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒ ธันวาคม ๒๕๖๓

ตามคำขอที่ยังถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๕๐ ถนนพัฒนาการ แขวงพัฒนาการ
เขตสวนหลวง กรุงเทพมหานคร ขอยกเลิกบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ออกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์
จำนวน ๘ ราย ได้แก่

๑) นายประจักษ์ วรณชชัย	ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๐๖๐
๒) นายจิรณัฐ ขาวละออ	ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๐๗๒
๓) นายพีรพัฒน์ คำคำ	ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๐๘
๔) นางสาวอรุณ คำคอง	ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๓๔
๕) นายกิตติพงศ์ แซ่ลี	ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๔๔
๖) นายจิรเมธ ประเสริฐศิริพงศ์	ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๖๐
๗) นายภัทรพงษ์ มนศาทอง	ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๖๗
๘) นางสาวจางวรรณ กระจำพันธุ	ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๘๑

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายธีรวัฒน์ อิศรางกูร ณ อยุธยา)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๔๔

ไปรษณีย์อิเล็กทรอนิกส์ sarabang@dw.mail.go.th



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ที่ อก ๐๓๓๐/ ๑๔๓๘

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๑๔ สิงหาคม ๒๕๖๓

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์
เอกชน ลงวันที่ ๒๗ พฤษภาคม ๒๕๖๓

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๓ แผ่น

ตามคำขอที่ยังถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุ
หนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๓๒๓ สถานที่ตั้งเลขที่ ๒๑๖/๓๐ หมู่ที่ ๕
ตำบลแม่ไม้คู่ อำเภอบลวกแดง จังหวัดระยอง ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย)
จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมห้องปฏิบัติการวิเคราะห์เอกชน

๑) นายเดช ช้างชน	ทะเบียนเลขที่ ๖-๓๒๓-ท-๐๐๐๑
๒) นางวิลาวัลย์ บริรักษ์	ทะเบียนเลขที่ ๖-๓๒๓-ท-๐๐๐๒
๓) นายสุพจน์ สดามเตือ	ทะเบียนเลขที่ ๖-๓๒๓-ท-๐๐๐๓

ข. เจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน

๑) นายณัฐพงษ์ เพ็ญชวนา	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๑
๒) นางสาวกัญจพรคนธ์ จักดี	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๒
๓) นางสาวจุฑาทิพย์ สัตทองหลาง	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๓
๔) นางสาวจิตติภา พรเรืองสุข	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๔
๕) นายสรวิชัย คุ้มกฤษฎ	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๕
๖) นายณัฐพล ออมพรวรรณ	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๖
๗) นายจิตรกร สีวันสา	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๗
๘) นายสิทธิพรชัย สุวรรณรัตน์	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๘
๙) นายสิทธิพันธ์ แสนาชิว	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๐๙
๑๐) นายอนุรัตน์ เฒ่า	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๑๐
๑๑) นายสุวิทย์ นวาทอง	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๑๑
๑๒) นายณัฐพล เจริญวิวงศ์	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๑๒
๑๓) นายชานนท์ บุญชื่น	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๑๓
๑๔) นายณัฐกานต์ วงศ์อินทร์อยู่	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๑๔
๑๕) นายอานนท์ โพธิ์พระทอง	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๑๕

๑๖) นายณัฐพล...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๑๖
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๑๖) นายณัฐพล...

- ๒ -

๑๖) นายณัฐพล...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๑๖
๑๗) นายศุภณัฐ...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๑๗
๑๘) นายณัฐ...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๑๘
๑๙) นายสุพจน์...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๑๙
๒๐) นายศุภณัฐ...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๒๐
๒๑) นายเอกชัย...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๒๑
๒๒) นายทรงเทพ...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๒๒
๒๓) นายพิภกร...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๒๓
๒๔) นางสาวนันทิยา...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๒๔
๒๕) นายสิทธิชัย...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๒๕
๒๖) นางสาวภาณุ...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๒๖
๒๗) นางสาวพจนา...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๒๗
๒๘) นางสาวอติภา...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๒๘
๒๙) นายพิทยา...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๒๙
๓๐) นางสาวชัชช...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๓๐
๓๑) ว่าที่ร้อยตรี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๓๑
๓๒) นายวรวิทย์...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๓๒
๓๓) นายศักดิ์...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๓๓
๓๔) นายสุศักดิ์...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๓๔
๓๕) นายสุภาพร...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๓๕
๓๖) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๓๖
๓๗) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๓๗
๓๘) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๓๘
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๔๐) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๔๐
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๔๕) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๔๕
๔๖) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๔๖
๔๗) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๔๗
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๔๙) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๔๙
๕๐) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๕๐
๕๑) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๕๑
๕๒) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๕๒
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๕๕) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๕๕
๕๖) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๕๖
๕๗) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๕๗
๕๘) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๕๘
๕๙) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๕๙
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๖๕) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๖๕
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๖๗) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๖๗
๖๘) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๖๘
๖๙) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๖๙
๗๐) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๗๐
๗๑) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๗๑
๗๒) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๗๒
๗๓) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๗๓
๗๔) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๗๔
๗๕) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๗๕
๗๖) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๗๖
๗๗) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๗๗
๗๘) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๗๘
๗๙) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๗๙
๘๐) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๘๐
๘๑) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๘๑
๘๒) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๘๒
๘๓) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๘๓
๘๔) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๘๔
๘๕) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๘๕
๘๖) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๘๖
๘๗) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๘๗
๘๘) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๘๘
๘๙) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๘๙
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๙๕) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๙๕
๙๖) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๙๖
๙๗) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๙๗
๙๘) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๙๘
๙๙) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๐๙๙
๑๐๐) นายสุธี...	ทะเบียนเลขที่ ๖-๓๒๓-จ-๐๑๐๐

๕๒) นายสุธี...

(๕๒) นายพรกร เจ็งเจริญ
(๕๓) นายวิภากร เขื่อนมาก
(๕๔) นายอนุวัช ทองขจรศักดิ์
(๕๕) นายอภิชาติ วิลาศ
(๕๖) นายจรัสศรี ศรีรักษา
(๕๗) นายประสานมิตร เขื่อนเพชร
(๕๘) นายภาณุวัฒน์ วิมล
(๖๐) นายสันติ ชัยชนะ
(๖๑) นายทินกร กุลชาติ

ทะเบียนเลขที่ ว-๒๒๓-จ-๐๐๕๔
ทะเบียนเลขที่ ว-๒๒๓-จ-๐๐๕๕
ทะเบียนเลขที่ ว-๒๒๓-จ-๐๐๕๖
ทะเบียนเลขที่ ว-๒๒๓-จ-๐๐๕๗
ทะเบียนเลขที่ ว-๒๒๓-จ-๐๐๕๘
ทะเบียนเลขที่ ว-๒๒๓-จ-๐๐๕๙
ทะเบียนเลขที่ ว-๒๒๓-จ-๐๐๖๐
ทะเบียนเลขที่ ว-๒๒๓-จ-๐๐๖๑
ทะเบียนเลขที่ ว-๒๒๓-จ-๐๐๖๒

ค. ขอบข่ายชนิดสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒๘ มิถุนายน ๒๕๖๓ หากประสงค์จะต่ออายุหนังสือ รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๖๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ


(นายพรกร เจ็งเจริญ)
รองเลขาธิการ
สำนักงานโรงงานอุตสาหกรรม

ศูนย์วิจัยและเคมียกย่องพิษโรงงานภาคตะวันออก
โทร. ๐ ๓๓๓๓ ๖๐๕๙ ต่อ ๕๐๐๑-๒
ไปรษณีย์อิเล็กทรอนิกส์ eww@dw.mae.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวทันฯ ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แล็บอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๒๓
ที่ กก ๐๓๒๐/ ๗๕๓๘ ลงวันที่ ๐๔ สิงหาคม ๒๕๖๗

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๔ รายการ
น้ำเสีย จำนวน 14 รายการ

ลำดับ ที่	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	Field Method ^[2]
12	Total Dissolved Solids	Dried at 180 °C ^[2]
13	Total Kjeldahl Nitrogen	Semi-Macro Kjeldahl Method ^[2]
14	Total Suspended Solids	Dried at 103-105 °C ^[2]

น้ำใต้ดิน จำนวน 3 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method ^[2]
2	pH	Electrometric Method ^[2]
3	Phenols	Distillation, Direct Photometric Method ^[2]

อากาศเสีย...

อากาศเสีย (ปล่อยระบาย) จำนวน 7 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Carbon Monoxide	1) Sampling Bag, Non-Dispersive Infrared Method ^[3] 2) Instrumental Analyzer Method ^[2]
2	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[2]
3	Opacity	Ringelmann's Method ^[4]
4	Oxide of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ^[4] 2) Instrumental Analyzer Method ^[10]
5	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Acid Method ^[9] 2) Instrumental Analyzer Method ^[11]
6	Sulfuric Acid	Isokinetic Sampling, Barium-Titrimetric Method ^[6]
7	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[7]

เอกสารอ้างอิง

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4. กระทรวงอุตสาหกรรม, ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549, เรื่อง กำหนดค่าปริมาณเพิ่มค่าวันต่อปีในอากาศที่ระบายออกจากรถยนต์ของรถยนต์นั่งส่วนบุคคลไม่เกิน 7 คน, ราชกิจจานุเบกษา, 4 ธันวาคม 2549, เล่มที่ 123 ตอนพิเศษ 1254
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๐๙ ตุลาคม ๒๕๖๗

เรื่อง แก้ไขรายชื่อเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง หนังสือ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขที่ Env.2024/005
ลงวันที่ ๓๐ สิงหาคม ๒๕๖๗

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ว-๓๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้ อำเภอลวกแดง
จังหวัดระยอง ขอแก้ไขเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน เนื่องจากมีความคลาดเคลื่อน ความละเอียด
แจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรม ได้รับทราบและดำเนินการแก้ไขรายชื่อเจ้าหน้าที่ห้องปฏิบัติการ
วิเคราะห์เอกชน จำนวน ๕ ราย ตามที่แจ้งเรียบร้อยแล้ว เป็นดังนี้

ลำดับที่ ๒๗ นางพจนา สีดา

ลำดับที่ ๒๘ นางสาวธนิศา กุลสุริวงศ์

ลำดับที่ ๓๐ นางชลธิชา สิบงกช

ลำดับที่ ๓๖ นายสุทธิศักดิ์ โชคปิณฑินท์

ลำดับที่ ๔๒ นายกันตณ มณีสัมพันธ์

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ


(นายพรยศ กลิ่นกรอง)
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