

คุณภาพน้ำทิ้ง



Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469007
Date Received : Jul 10, 2024
Date Reported : Jul 17, 2024
Report Number : 3058109-1

Page 1 of 1

Sample Number 2469007-5
Sampled Date Jul 10, 2024 10:13 AM
Sample Description Wastewater
Location Influent 3
Date Analysis Commenced Jul 10, 2024
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	172	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	624	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5200 B	Rayong
Oil & Grease	mg/L	-	3	4	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5200 B	Rayong
pH at 25 degree C	-	-	-	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	-	-	45.3	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2590 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	9380	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	181	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Chansorn Lertnathakunchai เรณูสนธิ์ ๓-323-๙461, Kardi Bundit Kitsupavanit เรณูสนธิ์ ๓-204-๙001

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

Technical Management

Photchana S.

Photchana Seeda
Scientist (4)
เรณูสนธิ์ ๓-323-๙446

Approved by

D. Chongchon

Dej Chongchon
Senior Manager
เรณูสนธิ์ ๓-323-๙442

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303-17V EN46



Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469007
Date Received : Jul 10, 2024
Date Reported : Jul 17, 2024
Report Number : 3058107-1

Page 1 of 1

Sample Number 2469007-7
Sampled Date Jul 10, 2024 10:10 AM
Sample Description Wastewater
Location Aeration 3A
Date Analysis Commenced Jul 10, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
pH at 25 degree C	-	-	-	7.7	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	41.1	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2590 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	10360	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	7280	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Chansorn Lertnathakunchai เรณูสนธิ์ ๓-323-๙461, Kardi Bundit Kitsupavanit เรณูสนธิ์ ๓-204-๙001

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Technical Management

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Approved by

D. Chongchon

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Analysis / Test Report

Lot ID: 2469007
Date Received : Jul 10, 2024
Date Reported : Jul 17, 2024
Report Number : 3058107-2

Page 1 of 1

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Sample Number 2469007-7
Sampled Date Jul 10, 2024 10:10 AM
Sample Description Wastewater
Location Aeration 3A
Date Analysis Commenced Jul 11, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Mixed Liquor Volatile Suspended Solids	mg/L	-	5	3760	Based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D, E	Bangkok
SV30	ml/L	-	2	870	In-house method based on Standard Methods, Rayong for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2170 C	Rayong

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Approved by

Siriluk P.

Siriluk Bunrak
Section Head

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Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469007
Date Received : Jul 10, 2024
Date Reported : Jul 17, 2024
Report Number : 3058108-1

Page 1 of 1

Sample Number 2469007-8
Sampled Date Jul 10, 2024 10:07 AM
Sample Description Wastewater
Location Aeration 3B
Date Analysis Commenced Jul 10, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
pH at 25 degree C	-	-	-	7.6	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	41.1	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2590 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	9560	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	9760	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Chansorn Lertnathakunchai เรณูสนธิ์ ๓-323-๙461, Kardi Bundit Kitsupavanit เรณูสนธิ์ ๓-204-๙001

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Technical Management

Photchana S.

Photchana Seeda
Scientist (4)
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Approved by

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Dej Chongchon
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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PPM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469007
Date Received : Jul 10, 2024
Date Reported : Jul 17, 2024
Report Number : 3027803-2

Page 1 of 1

Sample Number 2469007-8
Sampled Date Jul 10, 2024 10:07 AM
Sample Description Wastewater
Location Aeration 3B
Date Analysis Commenced Jul 11, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Mixed Liquor Volatile Suspended Solids	mg/L	-	5	4980	Based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D, E	Bangkok
SV30	ml/L	-	2	950	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2170 C	Rayong

Sampling By : Chaisorn Lertnankulchai, Kambundit Kitsuwanvit

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Approved by

Siriluk P.
Siriluk Bunruk
Section Head

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302-17U (ENL)



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PPM-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0042
Lot ID: 2469010
Date Received : Jul 10, 2024
Date Reported : Jul 13, 2024
Report Number : 3027803-1

Page 1 of 2

Sample Number 2469010-1
Sampled Date Jul 10, 2024 10:21 AM
Sample Description Wastewater
Location EFC2 3
Date Analysis Commenced Jul 10, 2024
Condition of Sample Contained in one amber glass bottle, two glass vials and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	4.4	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 5200 - G (1)	Rayong
COD *	mg/L	-	40	61	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	14	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	13	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.1	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (8)	Rayong
Temperature *	Degree C	-	-	38.2	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	10700	≤45000	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	2.5	≤100	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part 4610 (D)	Rayong

Technical Management

Chontichok
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Scientist (3)
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Approved by

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Senior Manager
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302-17U (ENL)



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PPM-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0042
Lot ID: 2469010
Date Received : Jul 10, 2024
Date Reported : Jul 19, 2024
Report Number : 3027803-1

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Sample Number 2469010-1
Sampled Date Jul 10, 2024 10:21 AM
Sample Description Wastewater
Location EFC2 3
Date Analysis Commenced Jul 10, 2024
Condition of Sample Contained in one amber glass bottle, two glass vials and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	31	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

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

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of Thai Plastic & Chemicals Public Co., Ltd.

Sampling By : Chaisorn Lertnankulchai โทรศัพท์ +323-99461, Kambundit Kitsuwanvit โทรศัพท์ +204-90001

Remark :
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Technical Management

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302-17U (ENL)



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PPM-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0009
Lot ID: 2469010
Date Received : Jul 10, 2024
Date Reported : Jul 20, 2024
Report Number : 3027803-2

Page 1 of 1

Sample Number 2469010-1
Sampled Date Jul 10, 2024 10:21 AM
Sample Description Wastewater
Location EFC2 3
Date Analysis Commenced Jul 10, 2024
Condition of Sample Contained in one amber glass bottle, two glass vials and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	ug/L	1.5	5	<5	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing							
Conductivity at 25 Degree C *	microhm/cm	-	0.5	19070	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Phosphate as P *	mg/L	0.002	0.005	0.027	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 : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of Thai Plastic & Chemicals Public Co., Ltd.

Sampling By : Chaisorn Lertnankulchai, Kambundit Kitsuwanvit

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Approved by

Summon C.
Summon Chaisuanvit
Scientist (3)

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302-17U (ENL)



Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PPH-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469011
Date Received : Jul 10, 2024
Date Reported : Jul 18, 2024
Report Number : 3059390-1

Page 1 of 1

Analyte	Unit	LOD	LOQ (LOB)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	25	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	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	7.8	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (8)	Rayong
Temperature *	Degree C	-	-	31.4	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2880	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	2.1	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Hong (C), part 1843 (0)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	46	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Chaimsom Lertnathakunchai หรือผู้แทนที่ 323-9461, Kumbundit Kitsapavut หรือผู้แทนที่ 3204-9001

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Technical Management

Photchana S.

Photchana Seeds
Scientist (4)
หรือผู้แทนที่ 323-9446

Approved by

D. Chongchon

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Senior Manager
หรือผู้แทนที่ 323-9442

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Analysis / Test Report

TESTING
No.0009

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PPH-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469011
Date Received : Jul 10, 2024
Date Reported : Jul 18, 2024
Report Number : 3059390-2

Page 1 of 1

Analyte	Unit	LOD	LOQ (LOB)	Result	Method	Testing Location
Water Testing						
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	4777	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Phosphate as P *	mg/L	0.002	0.005	0.947	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

Sampling By : Chaimsom Lertnathakunchai , Kumbundit Kitsapavut

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

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PPH-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469011
Date Received : Jul 10, 2024
Date Reported : Jul 18, 2024
Report Number : 3059390-1

Page 1 of 1

Analyte	Unit	LOD	LOQ (LOB)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	36	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	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.1	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (8)	Rayong
Temperature *	Degree C	-	-	33.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	5360	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	3.2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Hong (C), part 1843 (0)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	37	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Chaimsom Lertnathakunchai หรือผู้แทนที่ 323-9461, Kumbundit Kitsapavut หรือผู้แทนที่ 3204-9001

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Technical Management

Photchana S.

Photchana Seeds
Scientist (4)
หรือผู้แทนที่ 323-9446

Approved by

D. Chongchon

Dj Chongchon
Senior Manager
หรือผู้แทนที่ 323-9442

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Analysis / Test Report

TESTING
No.0009

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PPH-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469011
Date Received : Jul 10, 2024
Date Reported : Jul 18, 2024
Report Number : 3059390-2

Page 1 of 1

Analyte	Unit	LOD	LOQ (LOB)	Result	Method	Testing Location
Water Testing						
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	9079	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Phosphate as P *	mg/L	0.002	0.005	0.691	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

Sampling By : Chaimsom Lertnathakunchai , Kumbundit Kitsapavut

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Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueang, Rayong Thailand 21150
P/O : P994-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2478953
Date Received : Aug 14, 2024
Date Reported : Aug 22, 2024
Report Number : 3089781-1

Page 1 of 1

Sample Number	2478953-1					
Sampled Date	Aug 14, 2024 11:10 AM					
Sample Description	Wastewater					
Location	เก็บจากคลองที่ไหลในโรงงานอุตสาหกรรมภายในพื้นที่ของโรงงาน 50 เมตร (Up stream)					
Date Analysis Commenced	Aug 14, 2024					
Condition of Sample	Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	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	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5220 B	Rayong
pH at 25 degree C	-	-	-	8.5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	36.2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	3220	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.9	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part N63 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	54	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Ekklachai Tuntong เรณูสมิทธิ์ ร-323-0022, Karundont Khasavanant เรณูสมิทธิ์ ร-204-0001

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Technical Management

Photchanna S.

Photchanna Senda
Solebird (4)
เรณูสมิทธิ์ ร-323-0028

Approved by

Dej Changchan

Dej Changchan
Senior Manager
เรณูสมิทธิ์ ร-323-0001

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Analysis / Test Report

TESTING
No.0009

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueang, Rayong Thailand 21150
P/O : P994-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2478953
Date Received : Aug 14, 2024
Date Reported : Aug 22, 2024
Report Number : 3089781-2

Page 1 of 1

Sample Number	2478953-1						Page 1 of 2
Sampled Date	Aug 14, 2024 11:10 AM						
Sample Description	Wastewater						
Location	เก็บจากคลองรับน้ำของโรงงานอุตสาหกรรมภายในพื้นที่ของโรงงาน 50 เมตร (Up stream)						
Date Analysis Commenced	Aug 15, 2024						
Condition of Sample	Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location	
Volatile Organics Compounds							
1,2-Dichloroethane	ug/L	1.5	5	9.2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok	
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok	
Water Testing							
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	5592	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong	
Phosphate as P *	mg/L	0.002	0.005	0.635	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	

Sampling By : Ekklachai Tuntong , Karundont Khasavanant

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Approved by

Siriluk P.

Siriluk Burunk
Section Head

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Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueang, Rayong Thailand 21150
P/O : P994-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2478953
Date Received : Aug 14, 2024
Date Reported : Aug 22, 2024
Report Number : 3089782-1

Page 1 of 1

Sample Number	2478953-2					
Sampled Date	Aug 14, 2024 11:20 AM					
Sample Description	Wastewater					
Location	เก็บจากคลองรับน้ำของโรงงานอุตสาหกรรมภายในพื้นที่ของโรงงาน 50 เมตร (Down stream)					
Date Analysis Commenced	Aug 14, 2024					
Condition of Sample	Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	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	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5220 B	Rayong
pH at 25 degree C	-	-	-	8.6	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	35.9	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	4840	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.3	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part N63 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Ekklachai Tuntong เรณูสมิทธิ์ ร-323-0022, Karundont Khasavanant เรณูสมิทธิ์ ร-204-0001

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Technical Management

Photchanna S.

Photchanna Senda
Solebird (4)
เรณูสมิทธิ์ ร-323-0028

Approved by

Dej Changchan

Dej Changchan
Senior Manager
เรณูสมิทธิ์ ร-323-0001

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Analysis / Test Report

TESTING
No.0009

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueang, Rayong Thailand 21150
P/O : P994-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2478953
Date Received : Aug 14, 2024
Date Reported : Aug 22, 2024
Report Number : 3089782-2

Page 1 of 1

Sample Number	2478953-2					
Sampled Date	Aug 14, 2024 11:20 AM					
Sample Description	Wastewater					
Location	เก็บจากคลองรับน้ำของโรงงานอุตสาหกรรมภายในพื้นที่ของโรงงาน 50 เมตร (Down stream)					
Date Analysis Commenced	Aug 15, 2024					
Condition of Sample	Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Volatile Organics Compounds						
1,2-Dichloroethane	ug/L	1.5	5	5.4	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing						
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	8616	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Phosphate as P *	mg/L	0.002	0.005	0.568	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

Sampling By : Ekklachai Tuntong , Karundont Khasavanant

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Approved by

Siriluk P.

Siriluk Burunk
Section Head

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Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueangphadung, Muang, Rayong Thailand 21150
P/O : PMH-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2478947
Date Received : Aug 14, 2024
Date Reported : Aug 21, 2024
Report Number : 3088769-1

Page 1 of 1

Sample Number 2478947-5
Sampled Date Aug 14, 2024 10:55 AM
Sample Description Wastewater
Location Influent 3
Date Analysis Commenced Aug 14, 2024
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	291	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	674	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 D	Rayong
Oil & Grease	mg/L	-	3	<3	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	9.2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature °	Degree C	-	-	43.2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	11660	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	190	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Ekkechai Tunlong เภสัชกรวิชาชีพ ร.323-ว-0022, Kambundit Kitsapavannit เภสัชกรวิชาชีพ ร.204-ว-0001

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Technical Management

Photchana S.

Approved by

Dej Chongchon

Photchana Seeda
Scientist (4)Dej Chongchon
Senior Manager

ใบอนุญาตวิชาชีพ ร.323-ว-0028

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Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueangphadung, Muang, Rayong Thailand 21150
P/O : PMH-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2478947
Date Received : Aug 14, 2024
Date Reported : Aug 21, 2024
Report Number : 3088771-1

Page 1 of 1

Sample Number 2478947-7
Sampled Date Aug 14, 2024 10:50 AM
Sample Description Wastewater
Location Aeration 3A
Date Analysis Commenced Aug 14, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
pH at 25 degree C	-	-	-	7.3	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature °	Degree C	-	-	42.1	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	13180	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	9670	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Ekkechai Tunlong เภสัชกรวิชาชีพ ร.323-ว-0022, Kambundit Kitsapavannit เภสัชกรวิชาชีพ ร.204-ว-0001

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Technical Management

Photchana S.

Approved by

Dej Chongchon

Photchana Seeda
Scientist (4)Dej Chongchon
Senior Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueangphadung, Muang, Rayong Thailand 21150
P/O : PMH-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2478947
Date Received : Aug 14, 2024
Date Reported : Aug 21, 2024
Report Number : 3088771-2

Page 1 of 1

Sample Number 2478947-7
Sampled Date Aug 14, 2024 10:50 AM
Sample Description Wastewater
Location Aeration 3A
Date Analysis Commenced Aug 15, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Mixed Liquor Volatile Suspended Solids	mg/L	-	5	5280	Based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D, E	Bangkok
SV30	mL/L	-	2	950	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2570 C	Rayong

Sampling By : Ekkechai Tunlong เภสัชกรวิชาชีพ ร.323-ว-0022, Kambundit Kitsapavannit เภสัชกรวิชาชีพ ร.204-ว-0001

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Siriluk Buranok
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Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
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P/O : PMH-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2478947
Date Received : Aug 14, 2024
Date Reported : Aug 21, 2024
Report Number : 3088772-1

Page 1 of 1

Sample Number 2478947-8
Sampled Date Aug 14, 2024 10:45 AM
Sample Description Wastewater
Location Aeration 3B
Date Analysis Commenced Aug 14, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
pH at 25 degree C	-	-	-	7.2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature °	Degree C	-	-	40.9	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	15380	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	10490	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Ekkechai Tunlong เภสัชกรวิชาชีพ ร.323-ว-0022, Kambundit Kitsapavannit เภสัชกรวิชาชีพ ร.204-ว-0001

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Technical Management

Photchana S.

Approved by

Dej Chongchon

Photchana Seeda
Scientist (4)Dej Chongchon
Senior Manager

ใบอนุญาตวิชาชีพ ร.323-ว-0028

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2478947
Date Received : Aug 14, 2024
Date Reported : Aug 21, 2024
Report Number : 3090272-2

Page 1 of 1

Sample Number 2478947-0
Sampled Date Aug 14, 2024 10:45 AM
Sample Description Wastewater
Location Aeration 3B
Date Analysis Commenced Aug 15, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Mixed Liquor Volatile Suspended Solids	mg/L	-	5	5820	Based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D, E	Bangkok
SV30	ml/L	-	2	990	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2170 C	Rayong

Sampling By : Ekachai Tuntong - Karibundit Kitsapavant

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Siriluk Burmak
Section Head

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0042
Lot ID: 2478952
Date Received : Aug 14, 2024
Date Reported : Aug 22, 2024
Report Number : 3090231-1

Page 1 of 2

Sample Number 2478952-1
Sampled Date Aug 14, 2024 11:00 AM
Sample Description Wastewater
Location EFCT 3
Date Analysis Commenced Aug 14, 2024
Condition of Sample Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD *	mg/L	-	40	57	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Color (at Original pH)	ADME	-	5	20	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Color (at pH 7.0)	ADME	-	5	17	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5320 B	Rayong
pH at 25 degree C	-	-	-	8.0	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	39.9	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2530 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	13260	≤45000	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.9	≤100	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part N40 (D)	Rayong

Technical Management

Photchanas S.
Photchanas Seeda
Scientist (4)
เวชชานาสี พี-323-0028

Approved by

D. Chanchong
Dej Chanchong
Senior Manager
เวชชานาสี พี-323-0001

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Analysis / Test Report

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0042
Lot ID: 2478952
Date Received : Aug 14, 2024
Date Reported : Aug 22, 2024
Report Number : 3090231-1

Page 2 of 2

Sample Number 2478952-1
Sampled Date Aug 14, 2024 11:00 AM
Sample Description Wastewater
Location EFCT 3
Date Analysis Commenced Aug 14, 2024
Condition of Sample Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	10	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

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

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of Thai Plastic & Chemicals Public Co., Ltd.

Sampling By : Ekachai Tuntong เวชชานาสี พี-323-0022 , Karibundit Kitsapavant เวชชานาสี พี-204-0001

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Technical Management

Photchanas S.
Photchanas Seeda
Scientist (4)
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Approved by

D. Chanchong
Dej Chanchong
Senior Manager
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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0009
Lot ID: 2478952
Date Received : Aug 14, 2024
Date Reported : Aug 22, 2024
Report Number : 3090231-2

Page 1 of 1

Sample Number 2478952-1
Sampled Date Aug 14, 2024 11:00 AM
Sample Description Wastewater
Location EFCT 3
Date Analysis Commenced Aug 15, 2024
Condition of Sample Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatiles Organics Compounds							
1,2-Dichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing							
Conductivity at 25 Degree C *	microhm/cm	-	0.5	23080	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Phosphate as P *	mg/L	0.002	0.005	0.052	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 (F)	Rayong

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

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of Thai Plastic & Chemicals Public Co., Ltd.

Sampling By : Ekachai Tuntong , Karibundit Kitsapavant

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Siriluk Burmak
Section Head

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Analysis / Test Report

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P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2495459
Date Received : Sep 11, 2024
Date Reported : Sep 18, 2024
Report Number : 3114761-1

TESTING
No.0042

Page 1 of 1

Sample Number 2495459-5
Sampled Date Sep 11, 2024 10:30 AM
Sample Description Wastewater
Location Influent 3
Date Analysis Commenced Sep 11, 2024
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	287	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	643	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5200 B	Rayong
Oil & Grease	mg/L	-	3	9	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5200 B	Rayong
pH at 25 degree C	-	-	-	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	-	-	41.7	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	10620	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	680	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Ekkechai Tuntong เภสัชกรวิชาชีพ ร.323-ร.0022, Karubundit Kitsapavarn เภสัชกรวิชาชีพ ร.204-ร.0001

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Technical Management

Photchana S.

Photchana Seeds
Scientist (4)
หมายเลขโทรศัพท์ ร.323-ร.0028

Approved by

Dej Changchon

Dej Changchon
Senior Manager
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Analysis / Test Report

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P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2495459
Date Received : Sep 11, 2024
Date Reported : Sep 18, 2024
Report Number : 3114763-1

TESTING
No.0042

Page 1 of 1

Sample Number 2495459-7
Sampled Date Sep 11, 2024 10:25 AM
Sample Description Wastewater
Location Aeration 3A
Date Analysis Commenced Sep 11, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
pH at 25 degree C	-	-	-	7.1	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature °	Degree C	-	-	41.1	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	11640	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	24360	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Ekkechai Tuntong เภสัชกรวิชาชีพ ร.323-ร.0022, Karubundit Kitsapavarn เภสัชกรวิชาชีพ ร.204-ร.0001

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Senior Manager
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Analysis / Test Report

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P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2495459
Date Received : Sep 11, 2024
Date Reported : Sep 18, 2024
Report Number : 3114763-2

TESTING
No.0042

Page 1 of 1

Sample Number 2495459-7
Sampled Date Sep 11, 2024 10:25 AM
Sample Description Wastewater
Location Aeration 3A
Date Analysis Commenced Sep 12, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Mixed Liquor Volatile Suspended Solids	mg/L	-	5	16480	Based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D, E	Bangkok
SV30	ml/L	-	2	930	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2170 C	Rayong

Sampling By : Ekkechai Tuntong เภสัชกรวิชาชีพ ร.323-ร.0022, Karubundit Kitsapavarn เภสัชกรวิชาชีพ ร.204-ร.0001

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Approved by

Photchana S.

Photchana Seeds
Scientist (4)

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate 1-1 Road, Mueang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2495459
Date Received : Sep 11, 2024
Date Reported : Sep 18, 2024
Report Number : 3114764-1

TESTING
No.0042

Page 1 of 1

Sample Number 2495459-8
Sampled Date Sep 11, 2024 10:20 AM
Sample Description Wastewater
Location Aeration 3B
Date Analysis Commenced Sep 11, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
pH at 25 degree C	-	-	-	7.1	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature °	Degree C	-	-	41.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	12180	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	12370	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Ekkechai Tuntong เภสัชกรวิชาชีพ ร.323-ร.0022, Karubundit Kitsapavarn เภสัชกรวิชาชีพ ร.204-ร.0001

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

Photchana S.

Photchana Seeds
Scientist (4)
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Approved by

Dej Changchon

Dej Changchon
Senior Manager
หมายเลขโทรศัพท์ ร.323-ร.0001

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S:\Reports_AL\INCL\Jr (4.23PM)



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2495459
Date Received : Sep 11, 2024
Date Reported : Sep 18, 2024
Report Number : 3114764-2

Page 1 of 1

Sample Number : 2495459-8
Sampled Date : Sep 11, 2024 10:20 AM
Sample Description : Wastewater
Location : Aeration 3B
Date Analysis Commenced : Sep 12, 2024
Condition of Sample : Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Mixed Liquor Volatile Suspended Solids	mg/L	-	5	5760	Based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D, E	Bangkok
SV30	ml/L	-	2	900	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2170 C	Rayong

Sampling By : Ekkechua Tunzang , Karnduink Khasavarnit

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Approved by

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303-17V (BML)



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No 0042
Lot ID: 2495470
Date Received : Sep 11, 2024
Date Reported : Sep 19, 2024
Report Number : 3087060-1

Page 1 of 2

Sample Number : 2495470-1
Sampled Date : Sep 11, 2024 10:40 AM
Sample Description : Wastewater
Location : EFC2 3
Date Analysis Commenced : Sep 11, 2024
Condition of Sample : Contained in one amber glass bottle, two glass vials and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	4.1	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD *	mg/L	-	40	58	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5220 C	Rayong
Color (at Original pH)	ADMI	-	5	19	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	17	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.0	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (8)	Rayong
Temperature *	Degree C	-	-	38.0	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	12640	≤45000	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.7	≤100	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part N43 (D)	Rayong

Technical Management

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Approved by

D. Chongchon

Photchanas Seeda
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303-17V (BML)



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No 0042
Lot ID: 2495470
Date Received : Sep 11, 2024
Date Reported : Sep 19, 2024
Report Number : 3087060-1

Page 2 of 2

Sample Number : 2495470-1
Sampled Date : Sep 11, 2024 10:40 AM
Sample Description : Wastewater
Location : EFC2 3
Date Analysis Commenced : Sep 11, 2024
Condition of Sample : Contained in one amber glass bottle, two glass vials and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	12	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

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

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of Thai Plastic & Chemicals Public Co., Ltd.

Sampling By : Ekkechua Tunzang โทรศัพท์ +323-00022 , Karnduink Khasavarnit โทรศัพท์ +204-0001

Remark :
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Technical Management

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303-17V (BML)



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No 0009
Lot ID: 2495470
Date Received : Sep 11, 2024
Date Reported : Sep 20, 2024
Report Number : 3087060-2

Page 1 of 1

Sample Number : 2495470-1
Sampled Date : Sep 11, 2024 10:40 AM
Sample Description : Wastewater
Location : EFC2 3
Date Analysis Commenced : Sep 12, 2024
Condition of Sample : Contained in one amber glass bottle, two glass vials and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
L,2-Dichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 8200 B	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 8200 B	Bangkok
Vinyl chloride (Chloroethylene) *	mg/L	0.0015	0.005	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 8200 B	Bangkok
Water Testing							
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	21630	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Phosphate as P *	mg/L	0.002	0.005	0.259	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 : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of the Ministry of Industry dated June 07, B.E.2560 (2017).

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of Thai Plastic & Chemicals Public Co., Ltd.

Sampling By : Ekkechua Tunzang , Karnduink Khasavarnit

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Approved by

Siriluk P.

Siriluk Burak
Section Head

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303-17V (BML)



Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PP94-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2495472
Date Received : Sep 11, 2024
Date Reported : Sep 19, 2024
Report Number : 3115936-1

Page 1 of 1

Sample Number	2495472-1					
Sampled Date	Sep 11, 2024 11:25 AM					
Sample Description	Wastewater					
Location	เก็บจากคลองน้ำทิ้งของนิคมอุตสาหกรรมมาบตาพุดใกล้เขื่อนท้ายโรงบำบัด 50 เมตร (Up stream)					
Date Analysis Commenced	Sep 11, 2024					
Condition of Sample	Contained in one amber glass bottle, two glass vials and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	<25	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	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C	-	-	-	9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (8)	Rayong
Temperature *	Degree C	-	-	34.8	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2540	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.6	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part 4500 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	94	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Ekklachai Tuntong หรือเดิมชื่อ น.323-0022, Karibundit Kitsupavant หรือเดิมชื่อ น.204-0001

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Technical Management

Photchanas S.

Photchanas Seeda
Scientist (4)
หรือเดิมชื่อ น.323-0028

Approved by

D. Chumchun

Dej Chumchun
Senior Manager
หรือเดิมชื่อ น.323-0001

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Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PP94-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2495472
Date Received : Sep 11, 2024
Date Reported : Sep 20, 2024
Report Number : 3115936-2

Page 1 of 1

Sample Number	2495472-1					
Sampled Date	Sep 11, 2024 11:25 AM					
Sample Description	Wastewater					
Location	เก็บจากคลองน้ำทิ้งของนิคมอุตสาหกรรมมาบตาพุดใกล้เขื่อนท้ายโรงบำบัด 50 เมตร (Up stream)					
Date Analysis Commenced	Sep 12, 2024					
Condition of Sample	Contained in one amber glass bottle, two glass vials and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Volatile Organics Compounds						
1,2-Dichloroethane	ug/L	1.5	5	14.2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene) *	mg/L	0.0015	0.005	Not Detected	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Water Testing						
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	4711	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Rayong
Phosphate as P *	mg/L	0.002	0.005	0.721	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

Sampling By : Ekklachai Tuntong , Karibundit Kitsupavant

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Technical Management

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Siriluk Buranak
Section Head

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Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphut, Muang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106803
Date Received : Oct 09, 2024
Date Reported : Oct 17, 2024
Report Number : 3140163-1

Page 1 of 1

Sample Number	24106803-5					
Sampled Date	Oct 09, 2024 11:43 AM					
Sample Description	Wastewater					
Location	Influent 3					
Date Analysis Commenced	Oct 09, 2024					
Condition of Sample	Contained in one amber glass bottle and three plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	262	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	845	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	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.4	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	40.5	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	12660	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	467	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Sampling By : Ekkuai Tunong เรขกุลไพฑูริย์ 323-0022 , Kerdbundit Krasupavut เรขกุลไพฑูริย์ 324-0001

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Technical Management

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เรขกุลไพฑูริย์ 323-0028

Approved by

Dej Chongchon

Dej Chongchon
Senior Manager
เรขกุลไพฑูริย์ 323-0001

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Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphut, Muang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106803
Date Received : Oct 09, 2024
Date Reported : Oct 17, 2024
Report Number : 3140165-1

Page 1 of 1

Sample Number	24106803-7					
Sampled Date	Oct 09, 2024 11:38 AM					
Sample Description	Wastewater					
Location	Aeration 3A					
Date Analysis Commenced	Oct 09, 2024					
Condition of Sample	Contained in three plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
pH at 25 degree C	-	-	-	7.6	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	41.2	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	11400	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	11030	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Sampling By : Ekkuai Tunong เรขกุลไพฑูริย์ 323-0022 , Kerdbundit Krasupavut เรขกุลไพฑูริย์ 324-0001

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Technical Management

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Approved by

Dej Chongchon

Dej Chongchon
Senior Manager
เรขกุลไพฑูริย์ 323-0001

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S:\Shops\Print\AL_MLCL_09 (6-02PM)



Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphut, Muang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106803
Date Received : Oct 09, 2024
Date Reported : Oct 17, 2024
Report Number : 3140165-2

Page 1 of 1

Sample Number	24106803-7					
Sampled Date	Oct 09, 2024 11:38 AM					
Sample Description	Wastewater					
Location	Aeration 3A					
Date Analysis Commenced	Oct 10, 2024					
Condition of Sample	Contained in three plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Mixed Liquor Volatile Suspended Solids	mg/L	-	5	5420	Based on Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 24th ed., 2023, part 2540 D, E	Bangkok
SV30	mL/L	-	2	930	In-house method based on Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 24th ed., 2023, part 2170 C	Rayong

Sampling By : Ekkuai Tunong , Kerdbundit Krasupavut

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

Approved by

Photchanas S.

Photchanas Seeda
Scientist (4)

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Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphut, Muang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106803
Date Received : Oct 09, 2024
Date Reported : Oct 17, 2024
Report Number : 3140166-1

Page 1 of 1

Sample Number	24106803-8					
Sampled Date	Oct 09, 2024 11:36 AM					
Sample Description	Wastewater					
Location	Aeration 3B					
Date Analysis Commenced	Oct 09, 2024					
Condition of Sample	Contained in three plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
pH at 25 degree C	-	-	-	7.5	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	41.0	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	11480	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	11400	Standard Methods for the Examination of Water and Wastewater: APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Sampling By : Ekkuai Tunong เรขกุลไพฑูริย์ 323-0022 , Kerdbundit Krasupavut เรขกุลไพฑูริย์ 324-0001

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

Technical Management

Photchanas S.

Photchanas Seeda
Scientist (4)
เรขกุลไพฑูริย์ 323-0028

Approved by

Dej Chongchon

Dej Chongchon
Senior Manager
เรขกุลไพฑูริย์ 323-0001

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
B, Map Ta Phut Industrial Estate I-1 Road, Muang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106803
Date Received : Oct 09, 2024
Date Reported : Oct 17, 2024
Report Number : 3140166-2

Page 1 of 1

Sample Number : 24106803-8
Sampled Date : Oct 09, 2024 11:36 AM
Sample Description : Wastewater
Location : Effluent 3B
Date Analysis Commenced : Oct 10, 2024
Condition of Sample : Contained in three plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Mixed Liquor Volatile Suspended Solids	mg/L	-	5	5540	Based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D, E	Bangkok
SV30	ml/L	-	2	970	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2170 C	Rayong

Sampling By : Ekachai Tunlong, Karibundit Kitsupavanit

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

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Approved by

Photchan S.
Photchan Seeda
Scientist (4)

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5 (Report)Methd_AL_01_01 (2.01PM)



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
B, Map Ta Phut Industrial Estate I-1 Road, Muang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0042
Lot ID: 24106809
Date Received : Oct 09, 2024
Date Reported : Oct 16, 2024
Report Number : 3112270-1

Page 1 of 2

Sample Number : 24106809-1
Sampled Date : Oct 09, 2024 11:50 AM
Sample Description : Wastewater
Location : Effluent 3
Date Analysis Commenced : Oct 09, 2024
Condition of Sample : Contained in two glass vials, one amber glass bottle and three plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD *	mg/L	-	40	70	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 C	Rayong
Color (at Original pH)	ADMI	-	5	11	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	10	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	7.9	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	38.7	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	10220	≤45000	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	4.6	≤100	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C), part NRG (D)	Rayong

Technical Management

Photchan S.
Photchan Seeda
Scientist (4)
เบอร์โทรศัพท์ 3-323-0028

Approved by

Dej Changchon
Senior Manager
เบอร์โทรศัพท์ 3-323-0001

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5 (Report)Methd_AL_01_01 (2.01PM)



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
B, Map Ta Phut Industrial Estate I-1 Road, Muang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0042
Lot ID: 24106809
Date Received : Oct 09, 2024
Date Reported : Oct 16, 2024
Report Number : 3112270-2

Page 2 of 2

Sample Number : 24106809-1
Sampled Date : Oct 09, 2024 11:50 AM
Sample Description : Wastewater
Location : Effluent 3
Date Analysis Commenced : Oct 10, 2024
Condition of Sample : Contained in two glass vials, one amber glass bottle and three plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	15	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

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

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of Thai Plastic & Chemicals Public Co., Ltd.

Sampling By : Ekachai Tunlong เบอร์โทรศัพท์ 3-323-0022, Karibundit Kitsupavanit เบอร์โทรศัพท์ 3-323-0001

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

Photchan S.
Photchan Seeda
Scientist (4)
เบอร์โทรศัพท์ 3-323-0028

Approved by

Dej Changchon
Senior Manager
เบอร์โทรศัพท์ 3-323-0001

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5 (Report)Methd_AL_01_01 (2.01PM)



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
B, Map Ta Phut Industrial Estate I-1 Road, Muang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0009
Lot ID: 24106809
Date Received : Oct 09, 2024
Date Reported : Oct 16, 2024
Report Number : 3112270-2

Page 1 of 1

Sample Number : 24106809-1
Sampled Date : Oct 09, 2024 11:50 AM
Sample Description : Wastewater
Location : Effluent 3
Date Analysis Commenced : Oct 10, 2024
Condition of Sample : Contained in two glass vials, one amber glass bottle and three plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 8200 B	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 8200 B	Bangkok
Water Testing							
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	18060	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Phosphate as P *	mg/L	0.002	0.005	0.148	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 : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of Thai Plastic & Chemicals Public Co., Ltd.

Sampling By : Ekachai Tunlong, Karibundit Kitsupavanit

Remark :
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Approved by

Siriruk P.
Siriruk Burmak
Section Head

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5 (Report)Methd_AL_01_01 (2.01PM)



Analysis / Test Report

TESTING
No 0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Muang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24115027
Date Received : Nov 13, 2024
Date Reported : Nov 20, 2024
Report Number : 3171264-1

Page 1 of 1

Sample Number 24115027-5
Sampled Date Nov 13, 2024 10:25 AM
Sample Description Wastewater
Location Influent 3
Date Analysis Commenced Nov 13, 2024
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOD)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	82.9	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	454	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 B	Rayong
Oil & Grease	mg/L	-	3	3	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 B	Rayong
pH at 25 degree C	-	-	-	9.7	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature °	Degree C	-	-	38.5	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	8120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	528	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Sampling By : Ekkechai Tuntong เภสัชกรวิชาชีพ ร.323-ร.0022, Karabundit Kitsapornwat เภสัชกรวิชาชีพ ร.204-ร.0001

Remark :
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Technical Management

Photchana S.

Approved by

D. Chongchon

Photchana Seeda
Scientist (4)
หมายเลขวิชาชีพ ร.323-ร.0028

Daj Chongchon
Senior Manager
หมายเลขวิชาชีพ ร.323-ร.0001

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Analysis / Test Report

TESTING
No 0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Muang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24115027
Date Received : Nov 13, 2024
Date Reported : Nov 20, 2024
Report Number : 3171264-1

Page 1 of 1

Sample Number 24115027-7
Sampled Date Nov 13, 2024 10:20 AM
Sample Description Wastewater
Location Aeration 3A
Date Analysis Commenced Nov 13, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOD)	Result	Method	Testing Location
Water Testing						
pH at 25 degree C	-	-	-	7.8	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature °	Degree C	-	-	36.4	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	9120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C *	mg/L	-	5	14370	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Sampling By : Ekkechai Tuntong เภสัชกรวิชาชีพ ร.323-ร.0022, Karabundit Kitsapornwat เภสัชกรวิชาชีพ ร.204-ร.0001

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Technical Management

Photchana S.

Approved by

D. Chongchon

Photchana Seeda
Scientist (4)
หมายเลขวิชาชีพ ร.323-ร.0028

Daj Chongchon
Senior Manager
หมายเลขวิชาชีพ ร.323-ร.0001

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Analysis / Test Report

Lot ID: 24115027
Date Received : Nov 13, 2024
Date Reported : Nov 20, 2024
Report Number : 3171266-2

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Muang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Page 1 of 1

Sample Number 24115027-7
Sampled Date Nov 13, 2024 10:20 AM
Sample Description Wastewater
Location Aeration 3A
Date Analysis Commenced Nov 14, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOD)	Result	Method	Testing Location
Water Testing						
Mixed Liquor Volatile Suspended Solids	mg/L	-	5	7140	Based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D, E	Bangkok
SV30	ml/L	-	2	970	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2170 C	Rayong

Sampling By : Ekkechai Tuntong , Karabundit Kitsapornwat

Remark :
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Approved by

Siriluk P.

Siriluk Burmek
Section Head

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S:\Reports_ML\ML0104 (2.0)RM



Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Muang, Rayong Thailand 21150
P/O : PM4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24115027
Date Received : Nov 13, 2024
Date Reported : Nov 20, 2024
Report Number : 3171267-1

Page 1 of 1

Sample Number 24115027-8
Sampled Date Nov 13, 2024 10:15 AM
Sample Description Wastewater
Location Aeration 3B
Date Analysis Commenced Nov 13, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOD)	Result	Method	Testing Location
Water Testing						
pH at 25 degree C	-	-	-	7.8	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature °	Degree C	-	-	36.5	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	8720	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C *	mg/L	-	5	15000	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Sampling By : Ekkechai Tuntong เภสัชกรวิชาชีพ ร.323-ร.0022, Karabundit Kitsapornwat เภสัชกรวิชาชีพ ร.204-ร.0001

Remark :
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Technical Management

Photchana S.

Approved by

D. Chongchon

Photchana Seeda
Scientist (4)
หมายเลขวิชาชีพ ร.323-ร.0028

Daj Chongchon
Senior Manager
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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphut, Muang, Rayong Thailand 21150
P/O : 0904-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24115027
Date Received : Nov 13, 2024
Date Reported : Nov 20, 2024
Report Number : 3129654-2

Page 1 of 1

Sample Number 24115027-8
Sampled Date Nov 13, 2024 10:15 AM
Sample Description Wastewater
Location Aeration 3B
Date Analysis Commenced Nov 14, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Fixed Liquor Volatile Suspended Solids	mg/L	-	5	0280	Based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D, E	Bangkok
SV30	mL/L	-	2	960	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2170 C	Rayong

Sampling By : Ekachai Tunlong , Karabundit Khasupavanit

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Approved by

Siriluk P.
Siriluk Bunruk
Section Head

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphut, Muang, Rayong Thailand 21150
P/O : 0904-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0042
Lot ID: 24115035
Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 3129654-1

Page 1 of 2

Sample Number 24115035-1
Sampled Date Nov 13, 2024 10:35 AM
Sample Description Wastewater
Location EFC 3
Date Analysis Commenced Nov 13, 2024
Condition of Sample Contained in one amber glass bottle, two glass vials and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD *	mg/L	-	40	<40	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	13	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	11	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.1	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	36.0	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	9200	≤45000	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	1.6	≤100	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C), part 4843 (D)	Rayong

Technical Management

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphut, Muang, Rayong Thailand 21150
P/O : 0904-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0042
Lot ID: 24115035
Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 3129654-1

Page 2 of 2

Sample Number 24115035-1
Sampled Date Nov 13, 2024 10:35 AM
Sample Description Wastewater
Location EFC 3
Date Analysis Commenced Nov 13, 2024
Condition of Sample Contained in one amber glass bottle, two glass vials and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	15	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

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

Sampling By : Ekachai Tunlong โทรศัพท์มือถือ +66-9-0002 , Karabundit Khasupavanit โทรศัพท์มือถือ +66-9-0001

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Technical Management

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphut, Muang, Rayong Thailand 21150
P/O : 0904-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0009
Lot ID: 24115035
Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 3129654-2

Page 1 of 1

Sample Number 24115035-1
Sampled Date Nov 13, 2024 10:35 AM
Sample Description Wastewater
Location EFC 3
Date Analysis Commenced Nov 14, 2024
Condition of Sample Contained in one amber glass bottle, two glass vials and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Volatiles Organics Compounds							
I,2-Dichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Water Testing							
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	17070	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Phosphate as P *	mg/L	0.002	0.005	0.134	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 : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Sampling By : Ekachai Tunlong , Karabundit Khasupavanit

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Section Head

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303-17V (04L)



Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueang, Rayong Thailand 21150
P/O : PP4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24115037
Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 317277-1

Page 1 of 1

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	5.2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 5200 - D G	Rayong
COD	mg/L	1.5	25	<25	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	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.4	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (8)	Rayong
Temperature *	Degree C	-	-	32.5	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	1800	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	1.8	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-H (C), part 4500 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Sampling By : Ekksachai Tuntong, Kanchanadit Kibsupavanit, Kanchanadit Kibsupavanit

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Technical Management

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Photchanas Seeda
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Analysis / Test Report

TESTING
No.0009

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueang, Rayong Thailand 21150
P/O : PP4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24115037
Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 317277-2

Page 1 of 1

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Volatile Organics Compounds						
1,2-Dichloroethane	ug/L	1.5	5	14.6	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene) *	mg/L	0.0015	0.005	Not Detected	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Water Testing						
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	3992	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Phosphate as P *	mg/L	0.002	0.005	1.325	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

Sampling By : Ekksachai Tuntong, Kanchanadit Kibsupavanit

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Analysis / Test Report

TESTING
No.0042

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueang, Rayong Thailand 21150
P/O : PP4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24115037
Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 317277-1

Page 1 of 1

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 5200 - D G	Rayong
COD	mg/L	1.5	25	<25	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	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	8.4	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (8)	Rayong
Temperature *	Degree C	-	-	32.8	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	4940	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	2.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-H (C), part 4500 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	52	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Sampling By : Ekksachai Tuntong, Kanchanadit Kibsupavanit, Kanchanadit Kibsupavanit

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Analysis / Test Report

TESTING
No.0009

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mueang, Rayong Thailand 21150
P/O : PP4-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24115037
Date Received : Nov 13, 2024
Date Reported : Nov 21, 2024
Report Number : 317277-2

Page 1 of 1

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Volatile Organics Compounds						
1,2-Dichloroethane	ug/L	1.5	5	6.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Water Testing						
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	8056	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Phosphate as P *	mg/L	0.002	0.005	1.036	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

Sampling By : Ekksachai Tuntong, Kanchanadit Kibsupavanit

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphut, Muang, Rayong Thailand 21150
P/O : PPH-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24131499
Date Received : Dec 11, 2024
Date Reported : Dec 18, 2024
Report Number : 3196411-1

Page 1 of 1

Sample Number 24131499-5
Sampled Date Dec 11, 2024 10:55 AM
Sample Description Wastewater
Location Influent 3
Date Analysis Commenced Dec 11, 2024
Condition of Sample Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	93.7	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4300 - O G	Rayong
COD	mg/L	1.5	25	474	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	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	12.2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	39.1	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	8600	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	147	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Sampling By : Ekksachai Tunbong เรขนิพนธ์ ๓-323-๐022 , Kambundit Kitsupavanit เรขนิพนธ์ ๓-204-๐001

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Approved by

Dej Changchon

Dej Changchon
Senior Manager
เรขนิพนธ์ ๓-204-๐001

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphut, Muang, Rayong Thailand 21150
P/O : PPH-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24131499
Date Received : Dec 11, 2024
Date Reported : Dec 18, 2024
Report Number : 3196413-1

Page 1 of 1

Sample Number 24131499-7
Sampled Date Dec 11, 2024 10:50 AM
Sample Description Wastewater
Location Aeration 3A
Date Analysis Commenced Dec 11, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
pH at 25 degree C	-	-	-	7.8	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	36.7	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	9580	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	13710	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Sampling By : Ekksachai Tunbong เรขนิพนธ์ ๓-323-๐022 , Kambundit Kitsupavanit เรขนิพนธ์ ๓-204-๐001

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

Technical Management

Photchanas S.

Photchanas Seeda
Scientist (4)
เรขนิพนธ์ ๓-323-๐028

Approved by

Dej Changchon

Dej Changchon
Senior Manager
เรขนิพนธ์ ๓-204-๐001

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphut, Muang, Rayong Thailand 21150
P/O : PPH-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24131499
Date Received : Dec 11, 2024
Date Reported : Dec 18, 2024
Report Number : 3196413-2

Page 1 of 1

Sample Number 24131499-7
Sampled Date Dec 11, 2024 10:50 AM
Sample Description Wastewater
Location Aeration 3A
Date Analysis Commenced Dec 12, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Mixed Liquor Volatile Suspended Solids	mg/L	-	5	6480	Based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D, E	Bangkok
SV30	ml/L	-	2	650	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2179 C	Rayong

Sampling By : Ekksachai Tunbong , Kambundit Kitsupavanit

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

Approved by

Siriluk P.

Siriluk Bunruk
Section Head

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphut, Muang, Rayong Thailand 21150
P/O : PPH-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24131499
Date Received : Dec 11, 2024
Date Reported : Dec 18, 2024
Report Number : 3196414-1

Page 1 of 1

Sample Number 24131499-8
Sampled Date Dec 11, 2024 10:45 AM
Sample Description Wastewater
Location Aeration 3B
Date Analysis Commenced Dec 11, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
pH at 25 degree C	-	-	-	7.6	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	35.9	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	10080	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	17490	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Sampling By : Ekksachai Tunbong เรขนิพนธ์ ๓-323-๐022 , Kambundit Kitsupavanit เรขนิพนธ์ ๓-204-๐001

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Technical Management

Photchanas S.

Photchanas Seeda
Scientist (4)
เรขนิพนธ์ ๓-323-๐028

Approved by

Dej Changchon

Dej Changchon
Senior Manager
เรขนิพนธ์ ๓-204-๐001

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24131499
Date Received : Dec 11, 2024
Date Reported : Dec 18, 2024
Report Number : 3169414-2

Page 1 of 1

Sample Number 24131499-8
Sampled Date Dec 11, 2024 10:45 AM
Sample Description Wastewater
Location Aeration 3B
Date Analysis Commenced Dec 12, 2024
Condition of Sample Contained in three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Mixed Liquor Volatile Suspended Solids	mg/L	-	5	9140	Based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D, E	Bangkok
SV30	ml/L	-	2	950	In-house method based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2170 C	Rayong

Sampling By : Ekachai Tunong , Kerdwundit Khasapavanti

Remark :
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Approved by

Siriluk P.
Siriluk Barnak
Section Head

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



TESTING
No.0042
Lot ID: 24131508
Date Received : Dec 11, 2024
Date Reported : Dec 13, 2024
Report Number : 3169890-1

Page 1 of 3

Sample Number 24131508-1
Sampled Date Dec 11, 2024 11:05 AM
Sample Description Wastewater
Location EFCT 3
Date Analysis Commenced Dec 11, 2024
Condition of Sample Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD *	mg/L	-	40	<40	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 C	Rayong
Color (at Original pH)	ADMI	-	5	16	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	16	≤300	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C	-	-	-	7.6	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	-	-	36.6	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	10740	≤45000	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	1.3	≤100	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C), part N43 (B)	Rayong

Technical Management

Photchan S.
Photchan S.
Scientist (4)
วิมลวรรณ ร-323-0028

Approved by

Dej Chongchon
Dej Chongchon
Senior Manager
วิมลวรรณ ร-323-0001

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0042
Lot ID: 24131508
Date Received : Dec 11, 2024
Date Reported : Dec 19, 2024
Report Number : 3169890-1

Page 2 of 2

Sample Number 24131508-1
Sampled Date Dec 11, 2024 11:05 AM
Sample Description Wastewater
Location EFCT 3
Date Analysis Commenced Dec 11, 2024
Condition of Sample Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	8	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

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

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of Thai Plastic & Chemicals Public Co., Ltd.

Sampling By : Ekachai Tunong วิมลวรรณ ร-323-0002 , Kerdwundit Khasapavanti วิมลวรรณ ร-204-0001

Remark :
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Technical Management

Photchan S.
Photchan S.
Scientist (4)
วิมลวรรณ ร-323-0028

Approved by

Dej Chongchon
Dej Chongchon
Senior Manager
วิมลวรรณ ร-323-0001

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



TESTING
No.0009
Lot ID: 24131508
Date Received : Dec 11, 2024
Date Reported : Dec 20, 2024
Report Number : 3169890-2

Page 1 of 1

Sample Number 24131508-1
Sampled Date Dec 11, 2024 11:05 AM
Sample Description Wastewater
Location EFCT 3
Date Analysis Commenced Dec 12, 2024
Condition of Sample Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organic Compounds							
1,2-Dichloroethane	ug/L	1.5	5	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 6030 B	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	5.6	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 6030 B	Bangkok
Water Testing							
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	19380	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Phosphate as P *	mg/L	0.002	0.005	0.185	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 : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of Thai Plastic & Chemicals Public Co., Ltd.

Sampling By : Ekachai Tunong วิมลวรรณ ร-323-0002 , Kerdwundit Khasapavanti วิมลวรรณ ร-204-0001

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Approved by

Siriluk P.
Siriluk Barnak
Section Head

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PP49-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24131510
Date Received : Dec 11, 2024
Date Reported : Dec 19, 2024
Report Number : 3197457-1

Page 1 of 1

Sample Number	24131510-1					
Sampled Date	Dec 11, 2024 11:15 AM					
Sample Description	Wastewater					
Location	น้ำจากคลองรับน้ำของนิคมอุตสาหกรรมมาบตาพุดฝั่งซ้ายของโรงงาน 50 เมตร (Up stream)					
Date Analysis Commenced	Dec 11, 2024					
Condition of Sample	Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	2.2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	29	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	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 B	Rayong
pH at 25 degree C	-	-	-	8.5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	32.9	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	2960	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	2.2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-Horg (C), part H60 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	28	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Sampling By : Ekachai Tuntrong , Kardsundt Kitisupavanit

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Technical Management

Photchanas S.

Photchanas Seeda
Scientist (4)
เบอร์โทรแจ้งเหตุ : 323-9-0028

Approved by

D. Chuan

Dej Chuanthan
Senior Manager
เบอร์โทรแจ้งเหตุ : 323-9-0001

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PP49-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24131510
Date Received : Dec 11, 2024
Date Reported : Dec 20, 2024
Report Number : 3197457-2

Page 1 of 1

Page 1 of 3

Sample Number	24131510-1					
Sampled Date	Dec 11, 2024 11:15 AM					
Sample Description	Wastewater					
Location	น้ำจากคลองรับน้ำของนิคมอุตสาหกรรมมาบตาพุดฝั่งซ้ายของโรงงาน 50 เมตร (Up stream)					
Date Analysis Commenced	Dec 12, 2024					
Condition of Sample	Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Volatile Organics Compounds						
1,2-Dichloroethane	ug/L	1.5	5	20.9	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Water Testing						
Conductivity at 25 Degree C *	micromhos/cm	-	0.5	4838	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Phosphate as P *	mg/L	0.002	0.005	1.121	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
Sampling by : Ekkachai Tunhong , Kardsundit Kitisupawanit						
Remark : - LOD : Limit of Detection - "c" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting) - Analyte(s) marked * refers not included in scope of Accreditation ISO/IEC 17025. - The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.						

Sampling By : Ekachai Tuntrong , Kardsundt Kitisupavanit

Remark :
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Approved by

Siriluk P.

Siriluk Buranak
Section Head

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PP49-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24131510
Date Received : Dec 11, 2024
Date Reported : Dec 19, 2024
Report Number : 3197458-1

Page 1 of 1

Sample Number	24131510-2					
Sampled Date	Dec 11, 2024 11:25 AM					
Sample Description	Wastewater					
Location	น้ำจากคลองรับน้ำของนิคมอุตสาหกรรมมาบตาพุดฝั่งซ้ายของโรงงาน 50 เมตร (Down stream)					
Date Analysis Commenced	Dec 11, 2024					
Condition of Sample	Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOB)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2.0	2.1	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	36	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	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 5220 B	Rayong
pH at 25 degree C	-	-	-	8.3	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.3	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	5800	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	2.5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 4500-Horg (C), part H60 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	41	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Sampling By : Ekachai Tuntrong , Kardsundt Kitisupavanit

Remark :
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Technical Management

Photchanas S.

Photchanas Seeda
Scientist (4)
เบอร์โทรแจ้งเหตุ : 323-9-0028

Approved by

D. Chuan

Dej Chuanthan
Senior Manager
เบอร์โทรแจ้งเหตุ : 323-9-0001

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Mapthaphud, Muang, Rayong Thailand 21150
P/O : PP49-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24131510
Date Received : Dec 11, 2024
Date Reported : Dec 20, 2024
Report Number : 3197458-2

Page 1 of 1

Page 1 of 2

Sample Number	24131510-2					
Sampled Date	Dec 11, 2024 11:25 AM					
Sample Description	Wastewater					
Location	น้ำจากคลองรับน้ำของนิคมอุตสาหกรรมมาบตาพุดฝั่งซ้ายของโรงงาน 50 เมตร (Down stream)					
Date Analysis Commenced	Dec 12, 2024					
Condition of Sample	Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Volatiles Organics Compounds						
1,2-Dichloroethane	ug/L	1.5	5	8.2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	ug/L	1.5	5	Not Detected	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Water Testing						
Conductivity at 25 Degree C	micromhos/cm	-	0.5	9614	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24th ed., 2023, part 2510 B	Rayong
Phosphate as P	mg/L	0.002	0.005	0.947	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
Sampling By : Ekasachi Tunbang, Kardsubert Kitnupavant						
Remark : - LOD : Limit of Detection - LOR : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)						

Sampling By : Ekachai Tuntrong , Kardsundt Kitisupavanit

Remark :
- LOD : Limit of Detection
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Approved by

Siriluk P.

Siriluk Buranak
Section Head

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



TESTING
No.0009
Lot ID: 2469016
Date Received : Jul 26, 2024
Date Reported : Aug 05, 2024
Report Number : 3027812-1

Page 1 of 18

Sample Number 2469016-1
Sampled Date Jul 26, 2024 10:06 AM
Sample Description Groundwater
Location GSP 1-1
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.00007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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

Sampling By : Pattarapol Sawangjaitam เลขที่ ๖-204-๖-0002

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Technical Management

Siriluk P.

Siriluk Bunnak
Section Head
เลขที่ ๖-204-๖-0013

Approved by

Kanokkom Anek

Kanokkom Anek
Assistant General Manager
เลขที่ ๖-204-๖-0004

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



TESTING
No.0009
Lot ID: 2469016
Date Received : Jul 26, 2024
Date Reported : Aug 05, 2024
Report Number : 3027812-1

Page 2 of 18

Sample Number 2469016-2
Sampled Date Jul 26, 2024 10:07 AM
Sample Description Groundwater
Location GSP 1-2
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.00007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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

Sampling By : Pattarapol Sawangjaitam เลขที่ ๖-204-๖-0002

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Siriluk P.

Siriluk Bunnak
Section Head
เลขที่ ๖-204-๖-0013

Approved by

Kanokkom Anek

Kanokkom Anek
Assistant General Manager
เลขที่ ๖-204-๖-0004

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0009
Lot ID: 2469016
Date Received : Jul 26, 2024
Date Reported : Aug 05, 2024
Report Number : 3027812-1

Page 3 of 18

Sample Number 2469016-3
Sampled Date Jul 26, 2024 10:08 AM
Sample Description Groundwater
Location GSP 1-3
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.00007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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

Sampling By : Pattarapol Sawangjaitam ทะเบียนเลขที่ ๖-204-๖-0002

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Siriluk P.

Siriluk Bunnak
Section Head
ทะเบียนเลขที่ ๖-204-๖-0013

Approved by

Kanokorn Anek

Kanokorn Anek
Assistant General Manager
ทะเบียนเลขที่ ๖-204-๖-0004

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8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

TESTING
No.0009
Lot ID: 2469016
Date Received : Jul 26, 2024
Date Reported : Aug 05, 2024
Report Number : 3027812-1

Page 4 of 18

Sample Number 2469016-4
Sampled Date Jul 26, 2024 9:35 AM
Sample Description Groundwater
Location (GSP2-1) N
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.00007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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

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Siriluk P.

Siriluk Bunnak
Section Head
ทะเบียนเลขที่ ๖-204-๖-0013

Approved by

Kanokorn Anek

Kanokorn Anek
Assistant General Manager
ทะเบียนเลขที่ ๖-204-๖-0004

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Analysis / Test Report

TESTING
No.0009

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469016
Date Received : Jul 26, 2024
Date Reported : Aug 05, 2024
Report Number : 3027812-1

Page 5 of 18

Sample Number 2469016-5
Sampled Date Jul 26, 2024 9:38 AM
Sample Description Groundwater
Location (GSP2-2) (N)
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.0007	0.0005	0.0006	0.5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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

Sampling By : Pattarapol Sawangjaitam ทะเบียนเลขที่ 2-204-2-0002

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Siriluk Bunnak
Section Head
ทะเบียนเลขที่ 2-204-2-0013

Approved by

Kanokkorn Anek

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ 2-204-2-0004

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Analysis / Test Report

TESTING
No.0009

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469016
Date Received : Jul 26, 2024
Date Reported : Aug 05, 2024
Report Number : 3027812-1

Page 6 of 18

Sample Number 2469016-6
Sampled Date Jul 26, 2024 9:45 AM
Sample Description Groundwater
Location GSP 2-3
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.0007	0.0005	0.0104	0.5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	0.0078	0.03	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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

Sampling By : Pattarapol Sawangjaitam ทะเบียนเลขที่ 2-204-2-0002

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Technical Management

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Siriluk Bunnak
Section Head
ทะเบียนเลขที่ 2-204-2-0013

Approved by

Kanokkorn Anek

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ 2-204-2-0004

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Analysis / Test Report

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



TESTING
No.0009
Lot ID: 2469016
Date Received : Jul 26, 2024
Date Reported : Aug 05, 2024
Report Number : 3027812-1

Page 7 of 18

Sample Number 2469016-7
Sampled Date Jul 26, 2024 9:50 AM
Sample Description Groundwater
Location GSP3-1 (TPC-MW3)
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.00007	0.0005	0.0311	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	0.0009	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures
Sampling By : Pattarapol Sawangjaitam ทะเบียนเลขที่ 7-204-ก-0002

Remark :

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Technical Management

Siriluk P.

Siriluk Bunnak
Section Head
ทะเบียนเลขที่ 7-204-ก-0013

Approved by

Kanokkorn Anek

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ 7-204-ก-0004

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Client : Thai Plastic & Chemicals Public Co., Ltd.
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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



TESTING
No.0009
Lot ID: 2469016
Date Received : Jul 26, 2024
Date Reported : Aug 05, 2024
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Sample Number 2469016-8
Sampled Date Jul 26, 2024 9:51 AM
Sample Description Groundwater
Location GSP 3-2
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.00007	0.0005	0.0251	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	<0.0003	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures
Sampling By : Pattarapol Sawangjaitam ทะเบียนเลขที่ 7-204-ก-0002

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Technical Management

Siriluk P.

Siriluk Bunnak
Section Head
ทะเบียนเลขที่ 7-204-ก-0013

Approved by

Kanokkorn Anek

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ 7-204-ก-0004

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Analysis / Test Report

Client : Thal Plastic & Chemicals Public Co., Ltd.
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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



TESTING
No.0009

Lot ID: 2469016
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Sample Number 2469016-9
Sampled Date Jul 26, 2024 9:53 AM
Sample Description Groundwater
Location GSP 3-3
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.0007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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

Sampling By : Pattarapol Sawangjaitam ทะเบียนเลขที่ 7-204-9-0002

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



TESTING
No.0009

Lot ID: 2469016
Date Received : Jul 26, 2024
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Sample Number 2469016-10
Sampled Date Jul 26, 2024 10:45 AM
Sample Description Groundwater
Location GSP4-1 (TPC-MW2)
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.0007	0.0005	0.0007	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



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No.0009

Lot ID: 2469016
Date Received : Jul 26, 2024
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Sample Number 2469016-11
Sampled Date Jul 26, 2024 10:46 AM
Sample Description Groundwater
Location GSP 4-2
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.00007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



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No.0009

Lot ID: 2469016
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Sample Number 2469016-12
Sampled Date Jul 26, 2024 10:48 AM
Sample Description Groundwater
Location GSP 4-3
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.00007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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Project Name : Environmental Testing
Project Location :



TESTING
No.0009
Lot ID: 2469016
Date Received : Jul 26, 2024
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Sample Number 2469016-13
Sampled Date Jul 26, 2024 10:34 AM
Sample Description Groundwater
Location GSP 5-1
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.0007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



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Lot ID: 2469016
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Sample Number 2469016-14
Sampled Date Jul 26, 2024 10:36 AM
Sample Description Groundwater
Location GSP 5-2
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.0007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



TESTING
No.0009
Lot ID: 2469016
Date Received : Jul 26, 2024
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Sample Number	2469016-15						
Sampled Date	Jul 26, 2024 10:38 AM						
Sample Description	Groundwater						
Location	GSP 5-3						
Date Analysis Commenced	Jul 27, 2024						
Condition of Sample	Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.00007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



TESTING
No.0009
Lot ID: 2469016
Date Received : Jul 26, 2024
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Report Number : 3027812-1

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Sample Number	2469016-16						
Sampled Date	Jul 26, 2024 10:25 AM						
Sample Description	Groundwater						
Location	GSP6-1 (TPC-MW1)						
Date Analysis Commenced	Jul 27, 2024						
Condition of Sample	Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.00007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



TESTING
No.0009
Lot ID: 2469016
Date Received : Jul 26, 2024
Date Reported : Aug 05, 2024
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Sample Number 2469016-17
Sampled Date Jul 26, 2024 10:27 AM
Sample Description Groundwater
Location GSP 6-2
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.00007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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Technical Management

Siriluk P.

Siriluk Bunnak
Section Head
ทะเบียนเลขที่ 2-204-2-0013

Approved by

Kanokkom Anek

Kanokkom Anek
Assistant General Manager
ทะเบียนเลขที่ 2-204-2-0004

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :



TESTING
No.0009
Lot ID: 2469016
Date Received : Jul 26, 2024
Date Reported : Aug 05, 2024
Report Number : 3027812-1

Page 18 of 18

Sample Number 2469016-18
Sampled Date Jul 26, 2024 10:29 AM
Sample Description Groundwater
Location GSP 6-3
Date Analysis Commenced Jul 27, 2024
Condition of Sample Contained in two vials, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Volatile Organics Compounds							
1,2-Dichloroethane	mg/L	0.00007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 6200 B	Bangkok

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

Sampling By : Pattarapol Sawangjaitam ทะเบียนเลขที่ 2-204-2-0002

Remark :
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Technical Management

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Siriluk Bunnak
Section Head
ทะเบียนเลขที่ 2-204-2-0013

Approved by

Kanokkom Anek

Kanokkom Anek
Assistant General Manager
ทะเบียนเลขที่ 2-204-2-0004

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8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106818
Date Received : Dec 03, 2024
Date Reported : Dec 12, 2024
Report Number : 3112278-1

Page 1 of 14

Sample Number 24106818-3
Sampled Date Dec 02, 2024 9:30 AM
Sample Description Soil Gas
Location หน้า E3
Date Analysis Commenced Dec 06, 2024
Condition of Sample data sheet

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Soil gas						
Total VOCs	ppm	-	1.0	3.4	Total VOC Analyzer	Bangkok

Sampling By : Nontachal Uppathamp

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

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Siriluk Bunnak
Section Head

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Analysis / Test Report

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106818
Date Received : Dec 03, 2024
Date Reported : Dec 12, 2024
Report Number : 3112278-1

Page 2 of 14

Sample Number 24106818-4
Sampled Date Dec 02, 2024 10:10 AM
Sample Description Soil Gas
Location หน้า E4
Date Analysis Commenced Dec 06, 2024
Condition of Sample data sheet

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Soil gas						
Total VOCs	ppm	-	1.0	<1.0	Total VOC Analyzer	Bangkok

Sampling By : Nontachal Uppathamp

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

Approved by

Siriluk P.

Siriluk Bunnak
Section Head

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106818
Date Received : Dec 03, 2024
Date Reported : Dec 12, 2024
Report Number : 3112278-1

Page 3 of 14

Sample Number 24106818-5
Sampled Date Dec 02, 2024 10:05 AM
Sample Description Soil Gas
Location หน้า E5
Date Analysis Commenced Dec 06, 2024
Condition of Sample data sheet

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Soil gas						
Total VOCs	ppm	-	1.0	<1.0	Total VOC Analyzer	Bangkok

Sampling By : Nontachai Uppathamp

Remark :
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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106818
Date Received : Dec 03, 2024
Date Reported : Dec 12, 2024
Report Number : 3112278-1

Page 4 of 14

Sample Number 24106818-6
Sampled Date Dec 02, 2024 10:20 AM
Sample Description Soil Gas
Location หน้า E5
Date Analysis Commenced Dec 06, 2024
Condition of Sample data sheet

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Soil gas						
Total VOCs	ppm	-	1.0	<1.0	Total VOC Analyzer	Bangkok

Sampling By : Nontachai Uppathamp

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

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106818
Date Received : Dec 03, 2024
Date Reported : Dec 12, 2024
Report Number : 3112278-1

Page 5 of 14

Sample Number 24106818-9
Sampled Date Dec 02, 2024 9:50 AM
Sample Description Soil Gas
Location หน้า W3
Date Analysis Commenced Dec 06, 2024
Condition of Sample data sheet

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Soil gas						
Total VOCs	ppm	-	1.0	<1.0	Total VOC Analyzer	Bangkok

Sampling By : Nontachai Uppathamp

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

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Siriluk Bunnak
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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106818
Date Received : Dec 03, 2024
Date Reported : Dec 12, 2024
Report Number : 3112278-1

Page 6 of 14

Sample Number 24106818-10
Sampled Date Dec 02, 2024 9:55 AM
Sample Description Soil Gas
Location หน้า W4
Date Analysis Commenced Dec 06, 2024
Condition of Sample data sheet

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Soil gas						
Total VOCs	ppm	-	1.0	<1.0	Total VOC Analyzer	Bangkok

Sampling By : Nontachai Uppathamp

Remark :
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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106818
Date Received : Dec 03, 2024
Date Reported : Dec 12, 2024
Report Number : 3112278-1

Page 7 of 14

Sample Number 24106818-11
Sampled Date Dec 02, 2024 10:00 AM
Sample Description Soil Gas
Location หน้า W5
Date Analysis Commenced Dec 06, 2024
Condition of Sample data sheet

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Soil gas						
Total VOCs	ppm	-	1.0	<1.0	Total VOC Analyzer	Bangkok

Sampling By : Nontachai Uppathamp

Remark :
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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106818
Date Received : Dec 03, 2024
Date Reported : Dec 12, 2024
Report Number : 3112278-1

Page 8 of 14

Sample Number 24106818-12
Sampled Date Dec 02, 2024 10:30 AM
Sample Description Soil Gas
Location หน้า W6
Date Analysis Commenced Dec 06, 2024
Condition of Sample data sheet

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Soil gas						
Total VOCs	ppm	-	1.0	<1.0	Total VOC Analyzer	Bangkok

Sampling By : Nontachai Uppathamp

Remark :
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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106818
Date Received : Dec 03, 2024
Date Reported : Dec 12, 2024
Report Number : 3112278-1

Page 9 of 14

Sample Number 24106818-13
Sampled Date Dec 02, 2024 9:40 AM
Sample Description Soil Gas
Location หน้า E7
Date Analysis Commenced Dec 06, 2024
Condition of Sample data sheet

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Soil gas						
Total VOCs	ppm	-	1.0	<1.0	Total VOC Analyzer	Bangkok

Sampling By : Nontachai Uppathamp

Remark :
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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106818
Date Received : Dec 03, 2024
Date Reported : Dec 12, 2024
Report Number : 3112278-1

Page 10 of 14

Sample Number 24106818-14
Sampled Date Dec 02, 2024 10:40 AM
Sample Description Soil Gas
Location หน้า E8
Date Analysis Commenced Dec 06, 2024
Condition of Sample data sheet

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Soil gas						
Total VOCs	ppm	-	1.0	<1.0	Total VOC Analyzer	Bangkok

Sampling By : Nontachai Uppathamp

Remark :
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Siriluk Bunnak
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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106818
Date Received : Dec 03, 2024
Date Reported : Dec 12, 2024
Report Number : 3112278-1

Page 11 of 14

Sample Number 24106818-15
Sampled Date Dec 02, 2024 11:00 AM
Sample Description Soil Gas
Location บริเวณชั้นล่างของโรงงาน โทเทพลาสติกและเคมีภัณฑ์ จำกัด (มหาชน)
Date Analysis Commenced Dec 06, 2024
Condition of Sample data sheet

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Soil gas						
Total VOCs	ppm	-	1.0	<1.0	Total VOC Analyzer	Bangkok

Sampling By : Nontachai Uppathamp

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P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106818
Date Received : Dec 03, 2024
Date Reported : Dec 12, 2024
Report Number : 3112278-1

Page 12 of 14

Sample Number 24106818-16
Sampled Date Dec 02, 2024 11:15 AM
Sample Description Soil Gas
Location บริเวณถนนโอดี-หนึ่ง ติดกับ บริษัท พีทีที โกลบอล เคมิคอล จำกัด (มหาชน)
Date Analysis Commenced Dec 06, 2024
Condition of Sample data sheet

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Soil gas						
Total VOCs	ppm	-	1.0	<1.0	Total VOC Analyzer	Bangkok

Sampling By : Nontachai Uppathamp

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P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106818

Date Received : Dec 03, 2024

Date Reported : Dec 12, 2024

Report Number : 3112278-1

Page 13 of 14

Sample Number 24106818-17
Sampled Date Dec 02, 2024 11:30 AM
Sample Description Soil Gas
Location บริเวณถนนโหนดหนึ่ง ติดกับ บริษัท อติคณา เนอส์ซ่า เคมิคอลส์ (ประเทศไทย) จำกัด
Date Analysis Commenced Dec 06, 2024
Condition of Sample data sheet

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Soil gas						
Total VOCs	ppm	-	1.0	<1.0	Total VOC Analyzer	Bangkok

Sampling By : Nontachal Uppathamp

Remark :

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

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P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106818

Date Received : Dec 03, 2024

Date Reported : Dec 12, 2024

Report Number : 3112278-1

Page 14 of 14

Sample Number 24106818-18
Sampled Date Dec 02, 2024 11:45 AM
Sample Description Soil Gas
Location บริเวณถนนโหนดหนึ่ง ติดกับ บริษัท พีทีที โกลบอล เคมิคอล จำกัด (มหาชน)
Date Analysis Commenced Dec 06, 2024
Condition of Sample data sheet

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Soil gas						
Total VOCs	ppm	-	1.0	<1.0	Total VOC Analyzer	Bangkok

Sampling By : Nontachal Uppathamp

Remark :

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

Approved by

Siriluk P.

Siriluk Bunnak
Section Head

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

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ระดับเสียงภายในสถานประกอบการ



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2470009

Date Received : Jul 10, 2024

Date Reported : Jul 13, 2024

Report Number: 3054697-1

Page 1 of 1

Sample Number 2470009-1
Parameter Noise (Leq 8 hrs.)
Location Refrigeration VCM1
Measurement Date Jul 09, 2024
Measurement by Nantawat Sarin

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	79.4	84.7	77.9
10:00 AM - 11:00 AM	79.1	81.4	77.9
11:00 AM - 12:00 PM	79.3	82.5	78.0
12:00 PM - 01:00 PM	79.4	84.4	77.9
01:00 PM - 02:00 PM	79.2	85.9	77.9
02:00 PM - 03:00 PM	79.4	82.4	77.9
03:00 PM - 04:00 PM	79.9	82.9	78.4
04:00 PM - 05:00 PM	79.4	86.1	78.1

Leq Average 8 hrs. (dB(A))

79.4

Lmax (dB(A))

86.1

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย

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Technical Management

Thanita K.

Thanita Kulsurhwong
Scientist (4)

Approved by

Supot S.

Supot Salamteh
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Analysis / Test Report

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8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2470009

Date Received : Jul 10, 2024

Date Reported : Jul 13, 2024

Report Number: 3054698-1

Page 1 of 1

Sample Number 2470009-2
Parameter Noise (Leq 8 hrs.)
Location Oxychlorination (200) VCM1
Measurement Date Jul 09, 2024
Measurement by Nantawat Sarin

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:05 AM - 10:05 AM	82.8	93.1	82.1
10:05 AM - 11:05 AM	82.2	82.7	82.1
11:05 AM - 12:05 PM	82.2	82.5	82.1
12:05 PM - 01:05 PM	82.1	83.6	82.1
01:05 PM - 02:05 PM	82.3	91.3	82.1
02:05 PM - 03:05 PM	82.2	89.2	82.0
03:05 PM - 04:05 PM	82.4	89.4	82.2
04:05 PM - 05:05 PM	82.8	91.8	82.6

Leq Average 8 hrs. (dB(A))

82.4

Lmax (dB(A))

93.1

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

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P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2470009

Date Received : Jul 10, 2024

Date Reported : Jul 13, 2024

Report Number: 3054699-1

Page 1 of 1

Sample Number 2470009-3
Parameter Noise (Leq 8 hrs.)
Location EDC Purification (300) VCM1
Measurement Date Jul 09, 2024
Measurement by Nantawat Sarin

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	78.9	94.2	78.2
10:00 AM - 11:00 AM	78.2	81.2	78.1
11:00 AM - 12:00 PM	78.2	80.1	78.1
12:00 PM - 01:00 PM	78.2	82.9	78.0
01:00 PM - 02:00 PM	78.9	97.1	78.0
02:00 PM - 03:00 PM	78.1	80.2	78.0
03:00 PM - 04:00 PM	78.6	80.7	78.5
04:00 PM - 05:00 PM	78.8	97.0	77.9

Leq Average 8 hrs. (dB(A))

78.5

Lmax (dB(A))

97.1

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

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P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2470009

Date Received : Jul 10, 2024

Date Reported : Jul 13, 2024

Report Number: 3054700-1

Page 1 of 1

Sample Number 2470009-4
Parameter Noise (Leq 8 hrs.)
Location Incinerator (800) VCM1
Measurement Date Jul 09, 2024
Measurement by Nantawat Sarin

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:02 AM - 10:02 AM	77.4	87.5	77.0
10:02 AM - 11:02 AM	77.2	83.1	77.0
11:02 AM - 12:02 PM	77.0	77.5	76.9
12:02 PM - 01:02 PM	77.2	85.4	77.0
01:02 PM - 02:02 PM	77.4	87.6	77.1
02:02 PM - 03:02 PM	77.2	86.9	76.9
03:02 PM - 04:02 PM	77.4	87.1	77.1
04:02 PM - 05:02 PM	77.6	87.8	77.3

Leq Average 8 hrs. (dB(A))

77.3

Lmax (dB(A))

87.8

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

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Project Name : Environmental Testing

Project Location :

Lot ID: 2470009

Date Received : Jul 10, 2024

Date Reported : Jul 13, 2024

Report Number: 3054701-1

Page 1 of 1

Sample Number 2470009-5
Parameter Noise (Leq 8 hrs.)
Location Refrigeration VCM2
Measurement Date Jul 09, 2024
Measurement by Nantawat Sarin

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	83.0	85.3	82.3
10:00 AM - 11:00 AM	83.0	85.5	82.3
11:00 AM - 12:00 PM	83.1	85.6	82.2
12:00 PM - 01:00 PM	83.1	86.8	82.3
01:00 PM - 02:00 PM	83.1	85.9	82.3
02:00 PM - 03:00 PM	83.4	85.8	82.6
03:00 PM - 04:00 PM	83.2	85.6	82.4
04:00 PM - 05:00 PM	83.3	86.1	82.5

Leq Average 8 hrs. (dB(A))

83.2

Lmax (dB(A))

86.8

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

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P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2470009

Date Received : Jul 10, 2024

Date Reported : Jul 13, 2024

Report Number: 3054702-1

Page 1 of 1

Sample Number 2470009-6
Parameter Noise (Leq 8 hrs.)
Location Oxychlorination (200) VCM2
Measurement Date Jul 09, 2024
Measurement by Nantawat Sarin

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:06 AM - 10:06 AM	80.7	83.4	80.4
10:06 AM - 11:06 AM	80.6	83.0	80.4
11:06 AM - 12:06 PM	80.5	83.3	80.3
12:06 PM - 01:06 PM	81.3	96.1	80.4
01:06 PM - 02:06 PM	81.1	85.3	80.4
02:06 PM - 03:06 PM	81.9	85.8	80.4
03:06 PM - 04:06 PM	81.7	86.6	80.2
04:06 PM - 05:06 PM	81.5	85.7	80.8

Leq Average 8 hrs. (dB(A))

81.2

Lmax (dB(A))

96.1

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

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Technical Management

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P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2470009

Date Received : Jul 10, 2024

Date Reported : Jul 13, 2024

Report Number: 3054703-1

Page 1 of 1

Sample Number 2470009-7
Parameter Noise (Leq 8 hrs.)
Location EDC Purification (300) VCM2
Measurement Date Jul 09, 2024
Measurement by Nantawat Sarin

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:01 AM - 10:01 AM	79.5	86.5	78.6
10:01 AM - 11:01 AM	79.0	86.0	78.5
11:01 AM - 12:01 PM	78.8	86.3	78.5
12:01 PM - 01:01 PM	80.4	95.8	78.5
01:01 PM - 02:01 PM	81.7	89.3	78.5
02:01 PM - 03:01 PM	83.1	92.0	78.6
03:01 PM - 04:01 PM	83.5	92.4	79.0
04:01 PM - 05:01 PM	83.4	91.0	80.2

Leq Average 8 hrs. (dB(A))

81.6

Lmax (dB(A))

95.8

Standard (dB(A))

90

140

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P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2470009

Date Received : Jul 10, 2024

Date Reported : Jul 13, 2024

Report Number: 3054704-1

Page 1 of 1

Sample Number 2470009-8
Parameter Noise (Leq 8 hrs.)
Location Indenerator (800) VCM2
Measurement Date Jul 09, 2024
Measurement by Nantawat Sarin

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	77.0	92.8	76.0
10:00 AM - 11:00 AM	76.2	78.1	75.8
11:00 AM - 12:00 PM	75.9	77.1	75.5
12:00 PM - 01:00 PM	77.0	91.8	75.8
01:00 PM - 02:00 PM	76.2	80.1	75.8
02:00 PM - 03:00 PM	75.9	81.8	75.5
03:00 PM - 04:00 PM	75.7	81.6	75.3
04:00 PM - 05:00 PM	76.3	80.2	75.9

Leq Average 8 hrs. (dB(A))

76.3

Lmax (dB(A))

92.8

Standard (dB(A))

90

140

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P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106796

Date Received : Oct 09, 2024

Date Reported : Oct 16, 2024

Report Number: 3138197-1

Page 1 of 1

Sample Number 24106796-5
Parameter Noise (Leq 8 hrs.)
Location Refrigeration VCM2
Measurement Date Oct 08, 2024
Measurement by Tinnakorn Kumpasee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	83.8	86.8	83.0
10:00 AM - 11:00 AM	83.7	86.2	83.0
11:00 AM - 12:00 PM	83.6	86.0	82.9
12:00 PM - 01:00 PM	83.6	85.9	82.9
01:00 PM - 02:00 PM	83.5	85.8	82.8
02:00 PM - 03:00 PM	83.3	86.1	82.7
03:00 PM - 04:00 PM	83.4	85.8	82.8
04:00 PM - 05:00 PM	83.2	85.5	82.5

Leq Average 8 hrs. (dB(A))

83.5

Lmax (dB(A))

86.8

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

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P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106796

Date Received : Oct 09, 2024

Date Reported : Oct 16, 2024

Report Number: 3138198-1

Page 1 of 1

Sample Number 24106796-6
Parameter Noise (Leq 8 hrs.)
Location Oxychlorination (200) VCM2
Measurement Date Oct 08, 2024
Measurement by Tinnakorn Kumpasee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:55 AM - 09:55 AM	80.0	95.0	79.6
09:55 AM - 10:55 AM	80.0	86.3	79.4
10:55 AM - 11:55 AM	79.5	81.5	79.3
11:55 AM - 12:55 PM	79.6	82.9	79.3
12:55 PM - 01:55 PM	79.7	82.2	79.4
01:55 PM - 02:55 PM	79.5	81.5	79.3
02:55 PM - 03:55 PM	79.7	82.4	79.4
03:55 PM - 04:55 PM	79.2	81.2	79.0

Leq Average 8 hrs. (dB(A))

79.7

Lmax (dB(A))

95.0

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

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P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106796

Date Received : Oct 09, 2024

Date Reported : Oct 16, 2024

Report Number: 3138199-1

Page 1 of 1

Sample Number 24106796-7
Parameter Noise (Leq 8 hrs.)
Location EDC Purification (300) VCM2
Measurement Date Oct 08, 2024
Measurement by Tinnakorn Kumpasee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	79.2	83.6	79.0
10:00 AM - 11:00 AM	79.2	83.3	78.9
11:00 AM - 12:00 PM	78.9	84.5	78.8
12:00 PM - 01:00 PM	78.9	84.1	78.8
01:00 PM - 02:00 PM	79.1	89.0	78.8
02:00 PM - 03:00 PM	79.1	87.6	78.7
03:00 PM - 04:00 PM	79.0	87.4	78.7
04:00 PM - 05:00 PM	79.1	84.3	79.0

Leq Average 8 hrs. (dB(A))

79.1

Lmax (dB(A))

89.0

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supot S

Supot Salamteh
Section Head

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Analysis / Test Report

Client : Thal Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106796

Date Received : Oct 09, 2024

Date Reported : Oct 16, 2024

Report Number: 3138200-1

Page 1 of 1

Sample Number 24106796-8
Parameter Noise (Leq 8 hrs.)
Location Incinerator (800) VCM2
Measurement Date Oct 08, 2024
Measurement by Tinnakorn Kumpasee

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:59 AM - 09:59 AM	76.7	86.1	76.0
09:59 AM - 10:59 AM	76.4	78.1	76.0
10:59 AM - 11:59 AM	76.3	78.0	75.9
11:59 AM - 12:59 PM	76.0	77.9	75.7
12:59 PM - 01:59 PM	76.5	86.0	75.8
01:29 PM - 02:29 PM	76.1	84.2	75.7
02:59 PM - 03:59 PM	76.3	85.8	75.6
03:59 PM - 04:59 PM	76.1	78.0	75.8

Leq Average 8 hrs. (dB(A))

76.3

Lmax (dB(A))

86.1

Standard (dB(A))

90

140

Reference Method : ISO1996-1 and 1996-2

Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supot S

Supot Salamteh
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ระดับเสียงแยกความถี่



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2470011

Date Received : Jul 10, 2024

Date Reported : Jul 17, 2024

Report Number : 3058146-1

Page 1 of 1

Sample Number 2470011-1
Parameter Octave band
Location Refrigeration VCM1
Measurement Date Jul 09, 2024
Measurement By Nantawat Sarin

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
09:00 AM - 10:00 AM	79.4	18.0	33.4	45.6	55.2	66.5	73.6	72.9	74.7	70.0	55.1	41.5
10:00 AM - 11:00 AM	79.1	18.1	33.8	45.8	55.2	66.5	71.6	73.1	75.2	69.3	55.2	41.6
11:00 AM - 12:00 PM	79.3	18.0	33.4	45.5	55.1	66.6	72.7	72.8	75.1	70.1	55.1	41.4
12:00 PM - 01:00 PM	79.4	18.0	33.4	45.6	55.3	67.0	73.6	72.6	74.7	70.5	55.1	41.5
01:00 PM - 02:00 PM	79.2	18.3	33.6	45.7	55.1	66.6	72.6	72.9	74.8	70.3	55.0	41.4
02:00 PM - 03:00 PM	79.4	18.1	33.5	45.7	54.9	66.0	73.8	72.7	74.7	69.9	55.0	41.4
03:00 PM - 04:00 PM	79.9	18.6	34.0	46.2	55.4	66.5	74.3	73.2	75.2	70.4	55.5	41.9
04:00 PM - 05:00 PM	79.4	18.5	33.8	45.9	55.3	66.8	72.8	73.1	75.0	70.5	55.2	41.6
Average	79.4	18.2	33.6	45.8	55.2	66.6	73.2	72.9	74.9	70.1	55.2	41.5

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyong
Scientist (3)

Approved by

Supot S.
Supot Salamteah
Section Head

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2470011

Date Received : Jul 10, 2024

Date Reported : Jul 17, 2024

Report Number : 3058147-1

Page 1 of 1

Sample Number 2470011-2
Parameter Octave band
Location Oxychlorination (200) VCM1
Measurement Date Jul 09, 2024
Measurement By Nantawat Sarin

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
09:05 AM - 10:05 AM	82.8	22.1	35.9	47.5	58.0	65.3	69.4	74.9	77.5	79.2	68.8	48.5
10:05 AM - 11:05 AM	82.2	21.9	36.1	47.6	58.2	65.3	68.3	74.3	76.9	78.6	68.0	46.9
11:05 AM - 12:05 PM	82.2	21.9	35.9	47.3	57.8	65.0	68.1	74.3	76.9	78.6	68.1	46.9
12:05 PM - 01:05 PM	82.1	22.0	36.0	47.4	57.9	65.1	68.2	74.2	76.9	78.6	68.0	46.9
01:05 PM - 02:05 PM	82.3	22.0	36.1	47.6	58.0	65.1	68.4	74.5	77.1	78.7	68.4	47.5
02:05 PM - 03:05 PM	82.2	22.1	36.0	47.6	57.8	65.0	68.2	74.4	77.0	78.6	68.2	47.3
03:05 PM - 04:05 PM	82.4	22.3	36.2	47.8	58.0	65.2	68.4	74.6	77.2	78.8	68.4	47.5
04:05 PM - 05:05 PM	82.8	22.5	36.6	48.1	58.5	65.6	68.9	75.0	77.6	79.2	68.9	48.0
Average	82.4	22.1	36.1	47.6	58.0	65.2	68.5	74.5	77.1	78.8	68.4	47.5

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyong
Scientist (3)

Approved by

Supot S.
Supot Salamteah
Section Head

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Analysis / Test Report

Client : Thal Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2470011
Date Received : Jul 10, 2024
Date Reported : Jul 17, 2024
Report Number: 3058148-1

Page 1 of 1

Sample Number 2470011-3
Parameter Octave band
Location EDC Purification (300) VCM1
Measurement Date Jul 09, 2024
Measurement By Nantawat Sarin

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
09:00 AM - 10:00 AM	78.9	20.3	34.9	47.2	57.2	67.9	70.5	72.8	73.6	71.7	63.2	45.4
10:00 AM - 11:00 AM	78.2	20.0	35.1	47.2	57.2	67.8	69.2	71.8	73.1	71.6	63.0	45.0
11:00 AM - 12:00 PM	78.2	20.0	34.9	47.1	57.0	67.7	69.1	71.7	73.1	71.6	63.1	44.9
12:00 PM - 01:00 PM	78.2	19.7	34.8	47.1	56.9	67.7	69.0	71.7	73.0	71.6	63.1	45.0
01:00 PM - 02:00 PM	78.9	20.0	34.9	47.3	57.1	67.8	70.8	73.3	73.4	71.6	63.0	44.8
02:00 PM - 03:00 PM	78.1	19.8	34.7	47.1	56.9	67.6	69.0	71.7	72.9	71.5	63.0	44.8
03:00 PM - 04:00 PM	78.6	20.3	35.2	47.6	57.4	68.1	69.5	72.2	73.4	72.0	63.5	45.3
04:00 PM - 05:00 PM	78.8	19.9	34.8	47.2	57.0	67.7	70.7	73.2	73.3	71.5	62.9	44.7
Average	78.5	20.0	34.9	47.2	57.1	67.8	69.8	72.4	73.2	71.6	63.1	45.0

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyong
Scientist (3)

Approved by

Supot S.
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Thal Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2470011
Date Received : Jul 10, 2024
Date Reported : Jul 17, 2024
Report Number : 3058149-1

Page 1 of 1

Sample Number 2470011-4
Parameter Octave band
Location Indenerator (800) VCM1
Measurement Date Jul 09, 2024
Measurement By Nantawat Sarin

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
09:02 AM - 10:02 AM	77.4	29.5	49.4	53.2	59.3	63.6	68.6	71.7	73.2	69.4	55.6	32.3
10:02 AM - 11:02 AM	77.2	28.1	48.6	52.1	59.4	63.8	68.3	71.3	72.9	69.3	55.8	32.4
11:02 AM - 12:02 PM	77.0	28.0	48.6	52.0	59.3	63.5	68.0	71.1	72.8	69.3	55.5	31.4
12:02 PM - 01:02 PM	77.2	28.0	48.6	52.0	59.5	63.8	68.3	71.4	73.0	69.3	55.8	31.5
01:02 PM - 02:02 PM	77.4	28.1	48.6	52.5	59.4	63.9	68.6	71.7	73.1	69.4	56.0	32.3
02:02 PM - 03:02 PM	77.2	28.0	48.6	52.1	59.2	63.6	68.0	71.3	73.0	69.6	56.2	32.1
03:02 PM - 04:02 PM	77.4	28.2	48.8	52.3	59.4	63.8	68.2	71.5	73.2	69.8	56.4	32.3
04:02 PM - 05:02 PM	77.6	28.3	48.8	52.7	59.6	64.1	68.8	71.9	73.3	69.6	56.2	32.5
Average	77.3	28.3	48.8	52.4	59.4	63.8	68.4	71.5	73.1	69.5	55.9	32.1

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyong
Scientist (3)

Approved by

Supot S.
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Thal Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2470011

Date Received : Jul 10, 2024

Date Reported : Jul 17, 2024

Report Number : 3058150-1

Page 1 of 1

Sample Number 2470011-5
Parameter Octave band
Location Refrigeration VCM2
Measurement Date Jul 09, 2024
Measurement By Nantawat Sarin

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
09:00 AM - 10:00 AM	83.0	22.9	40.3	53.5	62.9	66.8	70.4	73.1	78.6	79.3	67.4	46.6
10:00 AM - 11:00 AM	83.0	23.0	40.3	53.6	62.8	66.8	70.4	73.0	78.4	79.4	67.4	46.6
11:00 AM - 12:00 PM	83.1	23.2	40.2	53.5	62.9	66.8	70.3	72.9	78.7	79.5	67.4	46.6
12:00 AM - 01:00 AM	83.1	23.1	40.5	53.7	63.2	67.0	70.8	73.2	78.6	79.3	67.3	46.6
01:00 PM - 02:00 PM	83.1	23.2	40.5	54.3	63.2	67.2	70.8	73.4	79.0	79.1	67.3	46.6
02:00 PM - 03:00 PM	83.4	23.4	40.3	54.3	63.6	67.7	70.9	73.5	79.3	79.3	67.4	46.5
03:00 PM - 04:00 PM	83.2	23.2	40.1	54.1	63.4	67.5	70.7	73.3	79.1	79.1	67.2	46.3
04:00 PM - 05:00 PM	83.3	23.4	40.7	54.5	63.4	67.4	71.0	73.6	79.2	79.3	67.5	46.8
Average	83.2	23.2	40.4	54.0	63.2	67.2	70.7	73.3	78.9	79.3	67.4	46.6

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyong
Scientist (3)

Approved by

Supot S.
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Thal Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2470011

Date Received : Jul 10, 2024

Date Reported : Jul 17, 2024

Report Number : 3058151-1

Page 1 of 1

Sample Number 2470011-6
Parameter Octave band
Location Oxychlorination (200) VCM2
Measurement Date Jul 09, 2024
Measurement By Nantawat Sarin

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
09:06 AM - 10:06 AM	80.7	20.0	36.6	47.9	59.2	67.2	71.5	75.4	75.7	73.8	62.2	43.9
10:06 AM - 11:06 AM	80.6	19.9	36.5	47.9	59.1	67.1	71.3	75.3	75.6	73.8	62.1	43.7
11:06 AM - 12:06 PM	80.5	19.8	36.5	48.0	59.1	67.1	71.1	75.2	75.4	73.7	62.0	43.4
12:06 PM - 01:06 PM	81.3	19.9	36.9	48.1	59.1	67.3	73.4	76.0	75.9	74.0	62.5	43.6
01:06 PM - 02:06 PM	81.1	19.9	36.6	49.0	59.4	67.2	71.7	75.9	76.1	74.3	63.0	44.1
02:06 PM - 03:06 PM	81.9	19.9	36.7	49.1	59.4	67.2	72.2	76.9	76.9	74.8	63.4	44.1
03:06 PM - 04:06 PM	81.7	19.7	36.5	48.9	59.2	67.0	72.0	76.7	76.7	74.6	63.2	43.9
04:06 PM - 05:06 PM	81.5	20.3	37.0	49.4	59.8	67.6	72.1	76.3	76.5	74.7	63.4	44.5
Average	81.2	19.9	36.7	48.6	59.3	67.2	72.0	76.0	76.1	74.2	62.8	43.9

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyong
Scientist (3)

Approved by

Supot S.
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Thal Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2470011
Date Received : Jul 10, 2024
Date Reported : Jul 17, 2024
Report Number: 3058152-1

Page 1 of 1

Sample Number 2470011-7
Parameter Octave band
Location EDC Purification (300) VCM2
Measurement Date Jul 09, 2024
Measurement By Nantawat Sarin

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
09:01 AM - 10:01 AM	79.5	21.5	37.1	49.2	62.1	67.8	71.7	74.9	74.0	69.8	60.9	48.3
10:01 AM - 11:01 AM	79.0	21.5	36.9	49.0	61.9	67.6	71.2	74.3	73.4	69.3	60.0	47.4
11:01 AM - 12:01 PM	78.8	21.2	37.0	49.0	61.9	67.6	71.1	74.2	73.2	69.1	59.5	46.9
12:01 PM - 01:01 PM	80.4	21.3	37.3	49.2	62.0	67.9	73.2	75.6	74.8	71.3	63.1	50.3
01:01 PM - 02:01 PM	81.7	21.2	37.2	49.9	62.2	68.0	72.8	77.1	76.4	73.3	65.8	53.6
02:01 PM - 03:01 PM	83.1	21.2	37.3	50.4	62.0	67.8	73.7	79.1	78.1	74.2	65.8	52.1
03:01 PM - 04:01 PM	83.5	21.6	37.7	50.8	62.4	68.2	74.1	79.5	78.5	74.6	66.2	52.5
04:01 PM - 05:01 PM	83.4	22.9	38.9	51.6	63.9	69.7	74.5	78.8	78.1	75.0	67.5	55.3
Average	81.6	21.6	37.5	50.0	62.3	68.1	73.0	77.2	76.3	72.7	64.5	51.7

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyong
Scientist (3)

Approved by

Supot S.
Supot Salamteh
Section Head

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S:\Reports\Air Noise\Octave band.rpt (1:27PM)



Analysis / Test Report

Client : Thal Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2470011
Date Received : Jul 10, 2024
Date Reported : Jul 17, 2024
Report Number: 3058153-1

Page 1 of 1

Sample Number 2470011-8
Parameter Octave band
Location Incinerator (800) VCM2
Measurement Date Jul 09, 2024
Measurement By Nantawat Sarin

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
09:00 AM - 10:00 AM	77.0	22.4	40.9	52.7	61.0	64.1	72.1	71.8	70.5	65.1	56.2	41.4
10:00 AM - 11:00 AM	76.2	22.4	40.8	52.4	60.9	63.8	70.9	71.0	69.9	64.9	56.0	40.9
11:00 AM - 12:00 PM	75.9	22.1	40.2	52.0	60.8	63.6	70.2	70.7	69.7	64.7	55.9	40.8
12:00 PM - 01:00 PM	77.0	22.2	40.4	52.3	60.9	64.0	72.4	71.8	70.2	64.9	56.0	41.2
01:00 PM - 02:00 PM	76.2	22.2	40.2	52.0	60.8	63.8	70.8	71.2	70.0	65.0	56.2	41.5
02:00 PM - 03:00 PM	75.9	22.0	39.9	51.8	60.7	63.6	70.3	70.9	69.7	64.8	56.0	41.0
03:00 PM - 04:00 PM	75.7	21.8	39.7	51.6	60.5	63.4	70.1	70.7	69.5	64.6	55.8	40.8
04:00 PM - 05:00 PM	76.3	22.3	40.3	52.1	60.9	63.9	70.9	71.3	70.1	65.1	56.3	41.6
Average	76.3	22.2	40.3	52.1	60.8	63.8	71.0	71.2	70.0	64.9	56.1	41.2

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyong
Scientist (3)

Approved by

Supot S.
Supot Salamteh
Section Head

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S:\Reports\Air Noise\Octave band.rpt (1:27PM)



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106798

Date Received : Oct 09, 2024

Date Reported : Oct 18, 2024

Report Number : 3141040-1

Page 1 of 1

Sample Number 24106798-5
Parameter Octave band
Location Refrigeration VCM2
Measurement Date Oct 08, 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
09:00 AM - 10:00 AM	83.8	24.4	40.9	54.3	66.3	68.2	72.2	74.4	80.0	78.8	70.5	54.7
10:00 AM - 11:00 AM	83.7	24.7	41.0	54.4	66.5	68.3	72.3	74.4	79.6	78.9	70.4	54.6
11:00 AM - 12:00 PM	83.6	25.0	40.9	54.3	66.5	68.2	72.2	74.4	79.3	79.0	70.3	54.5
12:00 PM - 01:00 PM	83.6	24.7	40.8	54.3	66.2	68.1	72.2	74.3	79.6	78.6	70.2	54.4
01:00 PM - 02:00 PM	83.5	24.6	41.0	54.5	66.2	68.1	72.2	74.4	79.5	78.7	70.3	54.4
02:00 PM - 03:00 PM	83.3	24.8	40.8	54.3	66.2	68.0	72.3	74.4	78.9	78.7	70.4	54.5
03:00 PM - 04:00 PM	83.4	25.4	40.7	54.3	66.1	68.0	72.1	74.3	79.0	78.8	70.5	54.7
04:00 PM - 05:00 PM	83.2	24.3	40.7	54.2	65.9	67.8	71.9	74.1	79.2	78.4	70.0	54.1
Average	83.5	24.8	40.9	54.3	66.2	68.1	72.2	74.3	79.4	78.7	70.3	54.5

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyong
Scientist (3)

Approved by

Supot S.
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106798

Date Received : Oct 09, 2024

Date Reported : Oct 18, 2024

Report Number : 3141041-1

Page 1 of 1

Sample Number 24106798-6
Parameter Octave band
Location Oxychlorination (200) VCM2
Measurement Date Oct 08, 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
08:55 AM - 09:55 AM	80.0	26.4	41.6	51.1	58.7	64.8	70.4	74.3	74.5	74.7	62.8	47.8
09:55 AM - 10:55 AM	80.0	20.6	37.2	48.0	57.2	64.4	70.3	74.0	74.7	74.7	62.8	47.7
10:55 AM - 11:55 AM	79.5	20.8	37.0	47.7	57.0	64.2	70.1	73.8	74.0	74.1	62.6	47.4
11:55 AM - 12:55 PM	79.6	20.4	36.9	47.7	57.0	64.3	70.1	73.9	74.1	74.1	62.5	47.3
12:55 PM - 01:55 PM	79.7	20.5	37.1	48.0	57.0	64.2	70.0	73.9	74.1	74.5	62.5	47.3
01:55 PM - 02:55 PM	79.5	20.4	36.8	48.1	57.0	64.1	69.9	73.8	74.0	74.1	62.5	47.3
02:55 PM - 03:55 PM	79.7	20.0	37.0	48.2	57.1	64.4	70.1	74.0	74.0	74.6	62.6	47.5
03:55 PM - 04:55 PM	79.2	20.1	36.5	47.8	56.7	63.8	69.6	73.5	73.7	73.8	62.2	47.0
Average	79.7	21.8	37.9	48.5	57.3	64.3	70.1	73.9	74.1	74.3	62.6	47.4

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakyong
Scientist (3)

Approved by

Supot S.
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106798

Date Received : Oct 09, 2024

Date Reported : Oct 18, 2024

Report Number : 3141042-1

Page 1 of 1

Sample Number 24106798-7
Parameter Octave band
Location EDC Purification (300) VCM2
Measurement Date Oct 08, 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
09:00 AM - 10:00 AM	79.2	22.0	38.2	50.0	60.6	67.6	71.1	73.9	74.1	70.3	63.5
10:00 AM - 11:00 AM	79.2	22.0	38.1	50.2	60.4	67.5	71.1	73.8	74.2	70.3	63.6
11:00 AM - 12:00 PM	78.9	22.0	37.9	49.8	60.2	67.3	71.0	73.7	73.8	69.9	63.4
12:00 PM - 01:00 PM	78.9	21.9	37.9	49.8	60.3	67.3	71.0	73.7	73.8	69.8	63.3
01:00 PM - 02:00 PM	79.1	21.9	38.1	50.0	60.2	67.2	71.0	73.9	74.0	70.1	63.5
02:00 PM - 03:00 PM	79.1	21.8	37.8	50.0	60.1	67.2	71.0	73.8	73.9	70.3	63.9
03:00 PM - 04:00 PM	79.0	21.5	37.8	50.1	60.5	67.1	71.0	73.7	73.8	70.2	63.6
04:00 PM - 05:00 PM	79.1	22.1	38.1	50.0	60.5	67.5	71.2	73.9	74.0	70.0	63.5
Average	79.1	21.9	38.0	50.0	60.4	67.3	71.1	73.8	74.0	70.1	63.5

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakhyong
Scientist (3)

Approved by

Supot S.
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106798

Date Received : Oct 09, 2024

Date Reported : Oct 18, 2024

Report Number : 3141043-1

Page 1 of 1

Sample Number 24106798-8
Parameter Octave band
Location Indinerator (800) VCM2
Measurement Date Oct 08, 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
08:59 AM - 09:59 AM	76.7	22.7	37.8	51.8	60.6	64.0	70.7	71.9	70.8	65.5	57.6
09:59 AM - 10:59 AM	76.4	22.5	37.4	51.5	60.4	63.6	70.9	71.4	70.0	65.2	57.9
10:59 AM - 11:59 AM	76.3	22.5	37.4	51.4	60.4	63.5	71.0	71.3	69.8	65.0	57.9
11:59 AM - 12:59 PM	76.0	22.1	37.4	51.4	60.4	63.5	70.0	71.3	69.8	64.8	56.9
12:59 PM - 01:59 PM	76.5	22.1	38.0	52.1	60.4	63.5	70.6	71.7	70.5	65.5	57.7
01:29 PM - 02:29 PM	76.1	22.0	37.5	51.4	60.3	63.4	70.1	71.3	70.0	65.1	57.1
02:59 PM - 03:59 PM	76.3	21.9	37.8	51.9	60.2	63.3	70.4	71.5	70.3	65.3	57.5
03:59 PM - 04:59 PM	76.1	22.2	37.5	51.5	60.5	63.6	70.1	71.4	69.9	64.9	57.0
Average	76.3	22.3	37.6	51.6	60.4	63.6	70.5	71.5	70.2	65.2	57.5

Reference Method : ANSI Standard S1.6-1984

Technical Management

Orawan R.
Orawan Rakhyong
Scientist (3)

Approved by

Supot S.
Supot Salamteh
Section Head

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ระดับเสียงติดตัวบุคคล



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2470016

Date Received : Jul 10, 2024

Date Reported : Jul 15, 2024

Report Number : 3029761-1

Page 1 of 2

Sample Number 2470016-1
Sampled Date Jul 09, 2024
Sample Description Noise Dose
Location Worker in VCM 1 Plant
Personal Sampling ถูกบันทึกค่าแล้ว
Date Analysis Commenced Jul 11, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (8 hrs.)	09:00 AM - 05:00 PM	%	-	1	63.1	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	09:00 AM - 05:00 PM	dB(A)	-	-	83.0	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)

Sampled By : Amnat Wongsakhen

Remark :

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

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Approved by

Supot S.

Supot Salamleh
Section Head

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Measurement Summary Report

Lot. 2470016-1

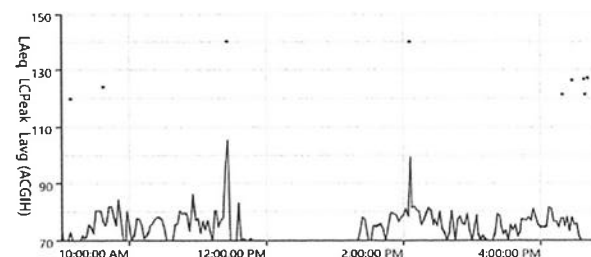
Name 1
Time 7/9/2024 09:00:00 AM Person Place Project
Duration 8
Instrument YF477, CR:110A

Calibration

Before 7/8/2024 08:26 PM Offset -2.80 dB After Offset

Peak & Max Values	
LCPeak	140.4 dB

ACGIH	
Lavg	83.0 dB
TWA	83.0 dB
Dose	63%
Est. Dose	63%





Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2470016
Date Received : Jul 10, 2024
Date Reported : Jul 15, 2024
Report Number : 3029761-1

Page 2 of 2

Sample Number 2470016-2
Sampled Date Jul 09, 2024
Sample Description Noise Dose
Location Worker In VCM 2 Plant
Personal Sampling กู้ดเสียงรบกวน ภายนอก
Date Analysis Commenced Jul 11, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (8 hrs.)	09:00 AM - 05:00 PM	%	-	1	21.4	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	09:00 AM - 05:00 PM	dB(A)	-	-	78.3	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong

Guideline :

- Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
- Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)

Sampled By : Amnat Wongsakhen

Remark :

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

Approved by

Supot S

Supot Salamitoh
Section Head

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Measurement Summary Report

Lot. 2470016-2

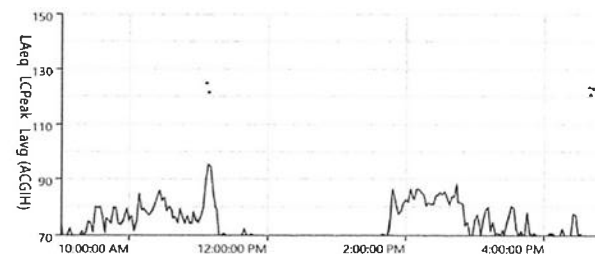
Name 3
Time 7/9/2024 09:00:00 AM Person Place Project
Duration 8
Instrument YF478, CR:110A

Calibration

Before 7/6/2024 08:24 PM Offset -2.90 dB After Offset

Peak & Max Values	
LCPeak	124.9 dB

ACGIH	
Lavg	78.3 dB
TWA	78.3 dB
Dose	21%
Est. Dose	21%





Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106799

Date Received : Oct 09, 2024

Date Reported : Oct 15, 2024

Report Number : 3112262-1

Page 1 of 1

Sample Number 24106799-2
Sampled Date Oct 08, 2024
Sample Description Noise Dose
Location Worker in VCM 2 Plant
Personal Sampling ฤดูร้อน ร้อนชื้น
Date Analysis Commenced Oct 10, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (8 hrs.)	08:30 AM - 04:30 PM	%	-	1	22.4	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Rayong
TWA (8 hrs.)	08:30 AM - 04:30 PM	dB(A)	-	-	78.5	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)

Sampled By : Tinnakorn Kumpasee

Remark :

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

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Approved by

Supot S.

Supot Salamteh
Section Head

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10/8/2024



Measurement Summary Report

Lot. 24106799-2

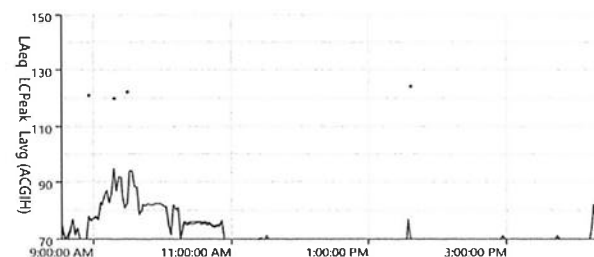
Name 1
Time 10/8/2024 08:32:00 AM Person Place Project
Duration 8
Instrument YG569, CR:110A

Calibration

Before 10/8/2024 07:30 AM Offset 1.50 dB After Offset

Peak & Max Values	
LCPeak	124.1 dB

ACGIH	
Lavg	78.5 dB
TWA	78.5 dB
Dose	22%
Est. Dose	22%



ระดับความเข้มของแสงสว่าง



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (1)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (1)-1

Page 1 of 1

Thai Plastic & Chemicals Public Co., Ltd.

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : 1st Floor : ๓๓ Log Sheet : VCM 1 Plant Sec.300	2495453 (1)-1	9-Sep-24	Night time	1	312	384	150	300	Pass
		2495453 (1)-2	9-Sep-24	Night time	2	408				
		2495453 (1)-3	9-Sep-24	Night time	3	396				
		2495453 (1)-4	9-Sep-24	Night time	4	419				
2	Area : 1st Floor : ๓๓ Log Sheet : VCM 2 Plant Sec.300	2495453 (1)-5	9-Sep-24	Night time	1	474	428	150	300	Pass
		2495453 (1)-6	9-Sep-24	Night time	2	419				
		2495453 (1)-7	9-Sep-24	Night time	3	398				
		2495453 (1)-8	9-Sep-24	Night time	4	421				
3	Area : 1st Floor : ๓๓ Log Sheet : PVC L-5 Plant Sec.700	2495453 (1)-9	9-Sep-24	Night time	1	493	441	150	300	Pass
		2495453 (1)-10	9-Sep-24	Night time	2	362				
		2495453 (1)-11	9-Sep-24	Night time	3	408				
		2495453 (1)-12	9-Sep-24	Night time	4	502				
4	Area : 1st Floor : ๓๓ Log Sheet : PVC L-6 Plant Sec.300	2495453 (1)-13	9-Sep-24	Night time	1	349	394	150	300	Pass
		2495453 (1)-14	9-Sep-24	Night time	2	412				
		2495453 (1)-15	9-Sep-24	Night time	3	363				
		2495453 (1)-16	9-Sep-24	Night time	4	453				
5	Area : 1st Floor : ๓๓ Log Sheet : PVC L-7 Plant Sec.600	2495453 (1)-17	9-Sep-24	Night time	1	296	314	150	300	Pass
		2495453 (1)-18	9-Sep-24	Night time	2	319				
		2495453 (1)-19	9-Sep-24	Night time	3	334				
		2495453 (1)-20	9-Sep-24	Night time	4	309				
6	Area : 1st Floor : ๓๓ Log Sheet : PVC L-8 Plant Sec.300	2495453 (1)-21	9-Sep-24	Night time	1	326	320	150	300	Pass
		2495453 (1)-22	9-Sep-24	Night time	2	298				
		2495453 (1)-23	9-Sep-24	Night time	3	310				
		2495453 (1)-24	9-Sep-24	Night time	4	345				
7	Area : 1st Floor : ๓๓ Log Sheet : PVC L-9 Plant Sec.200	2495453 (1)-25	9-Sep-24	Night time	1	334	346	150	300	Pass
		2495453 (1)-26	9-Sep-24	Night time	2	362				
		2495453 (1)-27	9-Sep-24	Night time	3	345				
		2495453 (1)-28	9-Sep-24	Night time	4	341				

Measurement by : Amnat Wongsakhen

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 390 dated February 21 B.E.2561 (2018)

Technical Management

Supot S
Supot Salamthah
Section Head

Approved by

Wichan Choonharat
Wichan Choonharat
Assistant Manager

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

Life Sciences

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (2)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (2)-1

Page 1 of 3

Thai Plastic & Chemicals Public Co., Ltd.

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Admin Building : 1st Floor : Meeting Room 4	2495453 (2)-1	9-Sep-24	Day time	1	1,117	1180	150	300	Pass
		2495453 (2)-2	9-Sep-24	Day time	2	1,293				
		2495453 (2)-3	9-Sep-24	Day time	3	1,167				
		2495453 (2)-4	9-Sep-24	Day time	4	1,165				
		2495453 (2)-5	9-Sep-24	Day time	5	1,245				
		2495453 (2)-6	9-Sep-24	Day time	6	1,092				
2	Area : Admin Building : 1st Floor : Meeting Room 5	2495453 (2)-7	9-Sep-24	Day time	1	790	763	400	500	Pass
		2495453 (2)-8	9-Sep-24	Day time	2	802				
		2495453 (2)-9	9-Sep-24	Day time	3	700				
		2495453 (2)-10	9-Sep-24	Day time	4	761				
4	Area : Admin Building : 1st Floor : Training Room 1	2495453 (2)-11	9-Sep-24	Day time	1	713	799	150	300	Pass
		2495453 (2)-12	9-Sep-24	Day time	2	558				
		2495453 (2)-13	9-Sep-24	Day time	3	1,040				
		2495453 (2)-14	9-Sep-24	Day time	4	935				
		2495453 (2)-15	9-Sep-24	Day time	5	839				
		2495453 (2)-16	9-Sep-24	Day time	6	749				
		2495453 (2)-17	9-Sep-24	Day time	7	721				
		2495453 (2)-18	9-Sep-24	Day time	8	935				
		2495453 (2)-19	9-Sep-24	Day time	9	843				
		2495453 (2)-20	9-Sep-24	Day time	10	981				
		2495453 (2)-21	9-Sep-24	Day time	11	587				
		2495453 (2)-22	9-Sep-24	Day time	12	689				
		2495453 (2)-23	9-Sep-24	Day time	13	1,089				
		2495453 (2)-24	9-Sep-24	Day time	14	894				
		2495453 (2)-25	9-Sep-24	Day time	15	739				
		2495453 (2)-26	9-Sep-24	Day time	16	804				
		2495453 (2)-27	9-Sep-24	Day time	17	617				
		2495453 (2)-28	9-Sep-24	Day time	18	670				

Technical Management

Supot S
Supot Salamthah
Section Head

Approved by

Wichan Choonharat
Wichan Choonharat
Assistant Manager

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P/O :

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Page 2 of 3

Thai Plastic & Chemicals Public Co., Ltd.										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
5	Area : Admin Building : 1st Floor : Training Room 2	2495453 (2)-29	9-Sep-24	Day time	1	882	859	150	300	Pass
		2495453 (2)-30	9-Sep-24	Day time	2	993				
		2495453 (2)-31	9-Sep-24	Day time	3	833				
		2495453 (2)-32	9-Sep-24	Day time	4	916				
		2495453 (2)-33	9-Sep-24	Day time	5	772				
		2495453 (2)-34	9-Sep-24	Day time	6	726				
		2495453 (2)-35	9-Sep-24	Day time	7	846				
		2495453 (2)-36	9-Sep-24	Day time	8	773				
		2495453 (2)-37	9-Sep-24	Day time	9	845				
		2495453 (2)-38	9-Sep-24	Day time	10	891				
		2495453 (2)-39	9-Sep-24	Day time	11	876				
		2495453 (2)-40	9-Sep-24	Day time	12	864				
		2495453 (2)-41	9-Sep-24	Day time	13	806				
		2495453 (2)-42	9-Sep-24	Day time	14	981				
		2495453 (2)-43	9-Sep-24	Day time	15	807				
		2495453 (2)-44	9-Sep-24	Day time	16	999				
		2495453 (2)-45	9-Sep-24	Day time	17	835				
		2495453 (2)-46	9-Sep-24	Day time	18	946				
6	Area : Admin Building : 1st Floor : HR&Admin Room	2495453 (2)-47	9-Sep-24	Day time	1	409	657	150	300	Pass
		2495453 (2)-48	9-Sep-24	Day time	2	472				
		2495453 (2)-49	9-Sep-24	Day time	3	856				
		2495453 (2)-50	9-Sep-24	Day time	4	854				
		2495453 (2)-51	9-Sep-24	Day time	5	726				
		2495453 (2)-52	9-Sep-24	Day time	6	559				
		2495453 (2)-53	9-Sep-24	Day time	7	725				
		2495453 (2)-54	9-Sep-24	Day time	8	613				
		2495453 (2)-55	9-Sep-24	Day time	9	764				
		2495453 (2)-56	9-Sep-24	Day time	10	603				
		2495453 (2)-57	9-Sep-24	Day time	11	826				
		2495453 (2)-58	9-Sep-24	Day time	12	711				
		2495453 (2)-59	9-Sep-24	Day time	13	649				
		2495453 (2)-60	9-Sep-24	Day time	14	588				
		2495453 (2)-61	9-Sep-24	Day time	15	585				
		2495453 (2)-62	9-Sep-24	Day time	16	719				
		2495453 (2)-63	9-Sep-24	Day time	17	597				
		2495453 (2)-64	9-Sep-24	Day time	18	527				

Technical Management


Supot Salamteh
Section Head

Approved by


Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location :

Lot ID: 2495453 (2)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (2)-1

Page 3 of 3

Thai Plastic & Chemicals Public Co., Ltd.										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
7	Area : Admin Building : 1st Floor : HR&Admin Meeting Room	2495453 (2)-65	9-Sep-24	Day time	1	600	515	150	300	Pass
		2495453 (2)-66	9-Sep-24	Day time	2	538				
		2495453 (2)-67	9-Sep-24	Day time	3	435				
		2495453 (2)-68	9-Sep-24	Day time	4	486				
8	Area : Admin Building : 1st Floor : IT Room	2495453 (2)-69	9-Sep-24	Day time	1	857	796	150	300	Pass
		2495453 (2)-70	9-Sep-24	Day time	2	703				
		2495453 (2)-71	9-Sep-24	Day time	3	779				
		2495453 (2)-72	9-Sep-24	Day time	4	846				
9	Spot : Admin Building : 1st Floor : HR&Admin Room (1)	2495453 (2)-73	9-Sep-24	Day time	1	830	-	400-500	-	Pass
10	Spot : Admin Building : 1st Floor : HR&Admin Room (2)	2495453 (2)-74	9-Sep-24	Day time	1	793	-	400-500	-	Pass
11	Spot : Admin Building : 1st Floor : HR&Admin Room (3)	2495453 (2)-75	9-Sep-24	Day time	1	829	-	400-500	-	Pass
12	Spot : Admin Building : 1st Floor : HR&Admin Room (4)	2495453 (2)-76	9-Sep-24	Day time	1	883	-	400-500	-	Pass

Measurement by : Amnat Wongsakhen

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management


Supot Salamteh
Section Head

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Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (3)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (3)-1

Page 1 of 4

Thai Plastic & Chemicals Public Co., Ltd.										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Admin Building : 2nd Floor : Meeting Room 1	2495453 (3)-1	9-Sep-24	Day time	1	869	890	150	300	Pass
		2495453 (3)-2	9-Sep-24	Day time	2	946				
		2495453 (3)-3	9-Sep-24	Day time	3	939				
		2495453 (3)-4	9-Sep-24	Day time	4	931				
		2495453 (3)-5	9-Sep-24	Day time	5	836				
		2495453 (3)-6	9-Sep-24	Day time	6	928				
		2495453 (3)-7	9-Sep-24	Day time	7	716				
		2495453 (3)-8	9-Sep-24	Day time	8	928				
		2495453 (3)-9	9-Sep-24	Day time	9	976				
		2495453 (3)-10	9-Sep-24	Day time	10	952				
		2495453 (3)-11	9-Sep-24	Day time	11	893				
		2495453 (3)-12	9-Sep-24	Day time	12	729				
		2495453 (3)-13	9-Sep-24	Day time	13	881				
		2495453 (3)-14	9-Sep-24	Day time	14	928				
		2495453 (3)-15	9-Sep-24	Day time	15	894				
2	Spot : Admin Building : 2nd Floor : ห้องประชุม	2495453 (3)-16	9-Sep-24	Day time	1	531	-	400-500	-	Pass
3	Area : Admin Building : 2nd Floor : Meeting Room 6	2495453 (3)-17	9-Sep-24	Day time	1	785	771	150	300	Pass
		2495453 (3)-18	9-Sep-24	Day time	2	704				
		2495453 (3)-19	9-Sep-24	Day time	3	637				
		2495453 (3)-20	9-Sep-24	Day time	4	945				
		2495453 (3)-21	9-Sep-24	Day time	5	783				
		2495453 (3)-22	9-Sep-24	Day time	6	692				
		2495453 (3)-23	9-Sep-24	Day time	7	707				
		2495453 (3)-24	9-Sep-24	Day time	8	918				
4	Area : Admin Building : 2nd Floor : Meeting Room 7	2495453 (3)-25	9-Sep-24	Day time	1	650	793	150	300	Pass
		2495453 (3)-26	9-Sep-24	Day time	2	690				
		2495453 (3)-27	9-Sep-24	Day time	3	863				
		2495453 (3)-28	9-Sep-24	Day time	4	837				
		2495453 (3)-29	9-Sep-24	Day time	5	887				
		2495453 (3)-30	9-Sep-24	Day time	6	813				
		2495453 (3)-31	9-Sep-24	Day time	7	739				
		2495453 (3)-32	9-Sep-24	Day time	8	866				

Technical Management

Supot S

Supot Salamteah
Section Head

Approved by

Wichan Choonharat

Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (3)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (3)-1

Page 2 of 4

Thai Plastic & Chemicals Public Co., Ltd.										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
5	Area : Admin Building : 2nd Floor : VCM Imprement office	2495453 (3)-33	9-Sep-24	Day time	1	807	683	150	300	Pass
		2495453 (3)-34	9-Sep-24	Day time	2	845				
		2495453 (3)-35	9-Sep-24	Day time	3	667				
		2495453 (3)-36	9-Sep-24	Day time	4	845				
		2495453 (3)-37	9-Sep-24	Day time	5	732				
		2495453 (3)-38	9-Sep-24	Day time	6	726				
		2495453 (3)-39	9-Sep-24	Day time	7	457				
		2495453 (3)-40	9-Sep-24	Day time	8	726				
		2495453 (3)-41	9-Sep-24	Day time	9	753				
		2495453 (3)-42	9-Sep-24	Day time	10	729				
		2495453 (3)-43	9-Sep-24	Day time	11	721				
		2495453 (3)-44	9-Sep-24	Day time	12	732				
		2495453 (3)-45	9-Sep-24	Day time	13	691				
		2495453 (3)-46	9-Sep-24	Day time	14	657				
		2495453 (3)-47	9-Sep-24	Day time	15	767				
		2495453 (3)-48	9-Sep-24	Day time	16	614				
		2495453 (3)-49	9-Sep-24	Day time	17	475				
		2495453 (3)-50	9-Sep-24	Day time	18	496				
7	Spot : Admin Building : 2nd Floor : 1BE Group	2495453 (3)-51	9-Sep-24	Day time	1	465	-	400-500	-	Pass
8	Spot : Admin Building : 2nd Floor : โต๊ะ งานผู้จัดการฝ่าย TPC	2495453 (3)-52	9-Sep-24	Day time	1	460	-	400-500	-	Pass
9	Spot : Admin Building : 2nd Floor : EH&S Department (1)	2495453 (3)-53	9-Sep-24	Day time	1	411	-	400-500	-	Pass
10	Spot : Admin Building : 2nd Floor : EH&S Department (2)	2495453 (3)-54	9-Sep-24	Day time	1	416	-	400-500	-	Pass
11	Spot : Admin Building : 2nd Floor : EH&S Department (3)	2495453 (3)-55	9-Sep-24	Day time	1	404	-	400-500	-	Pass
12	Spot : Admin Building : 2nd Floor : EH&S Department (4)	2495453 (3)-56	9-Sep-24	Day time	1	420	-	400-500	-	Pass
13	Spot : Admin Building : 2nd Floor : EH&S Department (5)	2495453 (3)-57	9-Sep-24	Day time	1	407	-	400-500	-	Pass
14	Spot : Admin Building : 2nd Floor : EH&S Department (6)	2495453 (3)-58	9-Sep-24	Day time	1	410	-	400-500	-	Pass
15	Spot : Admin Building : 2nd Floor : MD	2495453 (3)-59	9-Sep-24	Day time	1	546	-	400-500	-	Pass

Technical Management

Supot S

Supot Salamteah
Section Head

Approved by

Wichan Choonharat

Wichan Choonharat
Assistant Manager

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P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (3)

Date Received : Sep 10, 2024

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Page 3 of 4

Thai Plastic & Chemicals Public Co., Ltd.											
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment	
						Spot	Average	Spot/Min	Average		
16	Spot : Admin Building : 2nd Floor : viaoj จักรกรรณ VCM	2495453 (3)-60	9-Sep-24	Day time	1	546	-	400-500	-	Pass	
17	Spot : Admin Building : 2nd Floor : QM Department (1)	2495453 (3)-61	9-Sep-24	Day time	1	623	-	400-500	-	Pass	
18	Spot : Admin Building : 2nd Floor : QM Department (2)	2495453 (3)-62	9-Sep-24	Day time	1	543	-	400-500	-	Pass	
19	Spot : Admin Building : 2nd Floor : QM Department (3)	2495453 (3)-63	9-Sep-24	Day time	1	560	-	400-500	-	Pass	
20	Spot : Admin Building : 2nd Floor : QM Department (4)	2495453 (3)-64	9-Sep-24	Day time	1	610	-	400-500	-	Pass	
21	Spot : Admin Building : 2nd Floor : QM Department (5)	2495453 (3)-65	9-Sep-24	Day time	1	407	-	400-500	-	Pass	
22	Spot : Admin Building : 2nd Floor : QM Department (6)	2495453 (3)-66	9-Sep-24	Day time	1	460	-	400-500	-	Pass	
23	Spot : Admin Building : 2nd Floor : Process Technology Center (1)	2495453 (3)-67	9-Sep-24	Day time	1	496	-	400-500	-	Pass	
24	Spot : Admin Building : 2nd Floor : Process Technology Center (2)	2495453 (3)-68	9-Sep-24	Day time	1	448	-	400-500	-	Pass	
25	Spot : Admin Building : 2nd Floor : Process Technology Center (3)	2495453 (3)-69	9-Sep-24	Day time	1	430	-	400-500	-	Pass	
26	Spot : Admin Building : 2nd Floor : Process Technology Center (4)	2495453 (3)-70	9-Sep-24	Day time	1	412	-	400-500	-	Pass	
27	Spot : Admin Building : 2nd Floor : Process Technology Center (5)	2495453 (3)-71	9-Sep-24	Day time	1	430	-	400-500	-	Pass	
28	Spot : Admin Building : 2nd Floor : Process Technology Center (6)	2495453 (3)-72	9-Sep-24	Day time	1	472	-	400-500	-	Pass	
29	Spot : Admin Building : 2nd Floor : Process Technology Center (7)	2495453 (3)-73	9-Sep-24	Day time	1	417	-	400-500	-	Pass	
30	Spot : Admin Building : 2nd Floor : Process Technology Center (8)	2495453 (3)-74	9-Sep-24	Day time	1	447	-	400-500	-	Pass	
31	Spot : Admin Building : 2nd Floor : Process Technology Center (9)	2495453 (3)-75	9-Sep-24	Day time	1	515	-	400-500	-	Pass	

Technical Management

Supot Salamteah
Section Head

Approved by

Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (3)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (3)-1

Page 4 of 4

Thai Plastic & Chemicals Public Co., Ltd.											
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment	
						Spot	Average	Spot/Min	Average		
32	Spot : Admin Building : 2nd Floor : Costing Department (1)	2495453 (3)-76	9-Sep-24	Day time	1	411	-	400-500	-	Pass	
33	Spot : Admin Building : 2nd Floor : Costing Department (2)	2495453 (3)-77	9-Sep-24	Day time	1	436	-	400-500	-	Pass	
34	Spot : Admin Building : 2nd Floor : Costing Department (3)	2495453 (3)-78	9-Sep-24	Day time	1	496	-	400-500	-	Pass	
35	Spot : Admin Building : 2nd Floor : Costing Department (4)	2495453 (3)-79	9-Sep-24	Day time	1	493	-	400-500	-	Pass	
36	Spot : Admin Building : 2nd Floor : Costing Department (5)	2495453 (3)-80	9-Sep-24	Day time	1	415	-	400-500	-	Pass	
37	Spot : Admin Building : 2nd Floor : Costing Department (6)	2495453 (3)-81	9-Sep-24	Day time	1	412	-	400-500	-	Pass	
38	Spot : Admin Building : 2nd Floor : Costing Department (7)	2495453 (3)-82	9-Sep-24	Day time	1	453	-	400-500	-	Pass	
39	Spot : Admin Building : 2nd Floor : Costing Department (8)	2495453 (3)-83	9-Sep-24	Day time	1	515	-	400-500	-	Pass	
40	Spot : Admin Building : 2nd Floor : Costing Department (9)	2495453 (3)-84	9-Sep-24	Day time	1	437	-	400-500	-	Pass	
41	Area : Admin Building : 2nd Floor : VISUAL Management Room	2495453 (3)-85	9-Sep-24	Day time	1	941	797	150	300	Pass	
		2495453 (3)-86	9-Sep-24	Day time	2	812					
		2495453 (3)-87	9-Sep-24	Day time	3	817					
		2495453 (3)-88	9-Sep-24	Day time	4	657					
		2495453 (3)-89	9-Sep-24	Day time	5	661					
		2495453 (3)-90	9-Sep-24	Day time	6	781					
		2495453 (3)-91	9-Sep-24	Day time	7	835					
		2495453 (3)-92	9-Sep-24	Day time	8	871					

Measurement by : Amnat Wongsakhen

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 390 dated February 21 B.E.2561 (2018)

Technical Management

Supot Salamteah
Section Head

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Wichan Choonharat
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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location :

Lot ID: 2495453 (4)

Date Received : Sep 10, 2024

Date Reported : Sep 27, 2024

Report Number: 2495453 (4)-1 Rev. No.1

Page 1 of 3

Thai Plastic & Chemicals Public Co., Ltd.

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : Maintenance Shop : 1st Floor : บริเวณเครื่องจักร	2495453 (4)-1	9-Sep-24	Day time	1	308	-	200-300	-	Pass
2	Spot : Maintenance Shop : 1st Floor : โต๊ะ เก็บของชั้นงาน	2495453 (4)-2	9-Sep-24	Day time	1	427	-	200-300	-	Pass
3	Spot : Maintenance Shop : 1st Floor : Store Office 1	2495453 (4)-3	9-Sep-24	Day time	1	412	-	400-500	-	Pass
4	Spot : Maintenance Shop : 1st Floor : Store Office 2	2495453 (4)-4	9-Sep-24	Day time	1	422	-	400-500	-	Pass
5	Spot : Maintenance Shop : 1st Floor : ห้องผู้จัดการฝ่ายซ่อมบำรุง	2495453 (4)-5	9-Sep-24	Day time	1	604	-	400-500	-	Pass
11	Spot : Maintenance Shop : 1st Floor : Calibration Room (1)	2495453 (4)-6	9-Sep-24	Day time	1	885	-	700-800	-	Pass
12	Spot : Maintenance Shop : 1st Floor : Calibration Room (2)	2495453 (4)-7	9-Sep-24	Day time	1	926	-	700-800	-	Pass
13	Spot : Maintenance Shop : 1st Floor : แผนกเครื่องกล (1)	2495453 (4)-8	9-Sep-24	Day time	1	500	-	400-500	-	Pass
14	Spot : Maintenance Shop : 1st Floor : แผนกเครื่องกล (2)	2495453 (4)-9	9-Sep-24	Day time	1	539	-	400-500	-	Pass
15	Spot : Maintenance Shop : 1st Floor : แผนกเครื่องกล (3)	2495453 (4)-10	9-Sep-24	Day time	1	628	-	400-500	-	Pass
16	Spot : Maintenance Shop : 1st Floor : แผนกเครื่องกล (4)	2495453 (4)-11	9-Sep-24	Day time	1	517	-	400-500	-	Pass
17	Spot : Maintenance Shop : 1st Floor : แผนกเครื่องกล (5)	2495453 (4)-12	9-Sep-24	Day time	1	597	-	400-500	-	Pass
18	Spot : Maintenance Shop : 1st Floor : แผนกเครื่องกล (6)	2495453 (4)-13	9-Sep-24	Day time	1	488	-	400-500	-	Pass
19	Spot : Maintenance Shop : 1st Floor : แผนกเครื่องกล (7)	2495453 (4)-14	9-Sep-24	Day time	1	411	-	400-500	-	Pass
20	Spot : Maintenance Shop : 1st Floor : แผนกเครื่องกล (8)	2495453 (4)-15	9-Sep-24	Day time	1	603	-	400-500	-	Pass
21	Spot : Maintenance Shop : 1st Floor : แผนกเครื่องกล (9)	2495453 (4)-16	9-Sep-24	Day time	1	695	-	400-500	-	Pass

Technical Management

Supot S
Supot Salamteah
Section Head

Approved by

Nichan Ch
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location :

Lot ID: 2495453 (4)

Date Received : Sep 10, 2024

Date Reported : Sep 27, 2024

Report Number: 2495453 (4)-1 Rev. No.1

Page 2 of 3

Thai Plastic & Chemicals Public Co., Ltd.

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
22	Spot : Maintenance Shop : 1st Floor : แผนกเครื่องกล (10)	2495453 (4)-17	9-Sep-24	Day time	1	600	-	400-500	-	Pass
23	Spot : Maintenance Shop : 1st Floor : แผนกเครื่องกล (11)	2495453 (4)-18	9-Sep-24	Day time	1	448	-	400-500	-	Pass
24	Spot : Maintenance Shop : 1st Floor : แผนกเครื่องกล (12)	2495453 (4)-19	9-Sep-24	Day time	1	624	-	400-500	-	Pass
25	Area : Maintenance Shop : 1st Floor : SD Center Meeting Room	2495453 (4)-20 2495453 (4)-21 2495453 (4)-22 2495453 (4)-23	9-Sep-24 9-Sep-24 9-Sep-24 9-Sep-24	Day time Day time Day time Day time	1 2 3 4	397 390 357 355	375	150 300	300	Pass
29	Spot : Maintenance Shop : 1st Floor : Instrument Room (1)	2495453 (4)-24	9-Sep-24	Day time	1	436	-	400-500	-	Pass
30	Spot : Maintenance Shop : 1st Floor : Instrument Room (2)	2495453 (4)-25	9-Sep-24	Day time	1	662	-	400-500	-	Pass
31	Spot : Maintenance Shop : 1st Floor : Instrument Room (3)	2495453 (4)-26	9-Sep-24	Day time	1	726	-	400-500	-	Pass
32	Spot : Maintenance Shop : 1st Floor : Instrument Room (4)	2495453 (4)-27	9-Sep-24	Day time	1	513	-	400-500	-	Pass
33	Spot : Maintenance Shop : 1st Floor : Instrument Room (5)	2495453 (4)-28	9-Sep-24	Day time	1	425	-	400-500	-	Pass
34	Spot : Maintenance Shop : 1st Floor : Instrument Room (6)	2495453 (4)-29	9-Sep-24	Day time	1	817	-	400-500	-	Pass
35	Area : Maintenance Shop : 1st Floor : สำนักงาน Shop	2495453 (4)-30 2495453 (4)-31 2495453 (4)-32 2495453 (4)-33	9-Sep-24 9-Sep-24 9-Sep-24 9-Sep-24	Day time Day time Day time Day time	1 2 3 4	156 220 346 311	258	100 200	200	Pass
36	Area : Maintenance Shop : 1st Floor : สำนักงาน Shop	2495453 (4)-34 2495453 (4)-35 2495453 (4)-36 2495453 (4)-37 2495453 (4)-38 2495453 (4)-39 2495453 (4)-40 2495453 (4)-41	9-Sep-24 9-Sep-24 9-Sep-24 9-Sep-24 9-Sep-24 9-Sep-24 9-Sep-24 9-Sep-24	Day time Day time Day time Day time Day time Day time Day time Day time	1 2 3 4 5 6 7 8	536 648 1,894 6,100 3,270 1,631 3,390 5,920	2924	150 300	300	Pass

Technical Management

Supot S
Supot Salamteah
Section Head

Approved by

Nichan Ch
Wichan Choonharat
Assistant Manager

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Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (4)

Date Received : Sep 10, 2024

Date Reported : Sep 27, 2024

Report Number: 2495453 (4)-1 Rev. No.1

Page 3 of 3

Thai Plastic & Chemicals Public Co., Ltd.

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
37	Area : Maintenance Shop : 1st Floor : Store 2 : Spare Part	2495453 (4)-42	9-Sep-24	Day time	1	366	363	100	200	Pass
		2495453 (4)-43	9-Sep-24	Day time	2	403				
		2495453 (4)-44	9-Sep-24	Day time	3	340				
		2495453 (4)-45	9-Sep-24	Day time	4	344				

Measurement by : Amnat Wongsakhen

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Note : This Analysis test report is issued to supersede report No.2495453 (4) -1, Date Reported : Sep 12, 2024 due to revise sample information.

Technical Management

Supot S.

Supot Salamteh
Section Head

Approved by

Wichan Choonharat

Wichan Choonharat
Assistant Manager

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Client : Thai Plastic & Chemicals Public Co., Ltd.

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P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (5)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (5)-1

Page 1 of 1

Thai Plastic & Chemicals Public Co., Ltd.

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : Maintenance Shop : 2nd Floor : Electronic Maintenance Room (1)	2495453 (5)-1	9-Sep-24	Day time	1	496	-	400-500	-	Pass
2	Spot : Maintenance Shop : 2nd Floor : Electronic Maintenance Room (2)	2495453 (5)-2	9-Sep-24	Day time	1	733	-	400-500	-	Pass
3	Spot : Maintenance Shop : 2nd Floor : Electronic Maintenance Room (3)	2495453 (5)-3	9-Sep-24	Day time	1	791	-	400-500	-	Pass
4	Spot : Maintenance Shop : 2nd Floor : Electronic Maintenance Room (4)	2495453 (5)-4	9-Sep-24	Day time	1	829	-	400-500	-	Pass
5	Spot : Maintenance Shop : 2nd Floor : Electronic Maintenance Room (5)	2495453 (5)-5	9-Sep-24	Day time	1	515	-	400-500	-	Pass
6	Spot : Maintenance Shop : 2nd Floor : Electronic Maintenance Room (6)	2495453 (5)-6	9-Sep-24	Day time	1	420	-	400-500	-	Pass
7	Area : Maintenance Shop : 2nd Floor : Maintenance Meeting Room 1	2495453 (5)-7	9-Sep-24	Day time	1	1,009	1034	150	300	Pass
		2495453 (5)-8	9-Sep-24	Day time	2	868				
		2495453 (5)-9	9-Sep-24	Day time	3	1,158				
		2495453 (5)-10	9-Sep-24	Day time	4	1,100				
8	Spot : Maintenance Shop : 2nd Floor : Predictive Maintenance Room (1)	2495453 (5)-11	9-Sep-24	Day time	1	952	-	400-500	-	Pass
9	Spot : Maintenance Shop : 2nd Floor : Predictive Maintenance Room (2)	2495453 (5)-12	9-Sep-24	Day time	1	407	-	400-500	-	Pass
10	Spot : Maintenance Shop : 2nd Floor : Predictive Maintenance Room (3)	2495453 (5)-13	9-Sep-24	Day time	1	812	-	400-500	-	Pass
11	Spot : Maintenance Shop : 2nd Floor : Predictive Maintenance Room (4)	2495453 (5)-14	9-Sep-24	Day time	1	796	-	400-500	-	Pass
12	Spot : Maintenance Shop : 2nd Floor : Predictive Maintenance Room (5)	2495453 (5)-15	9-Sep-24	Day time	1	998	-	400-500	-	Pass

Measurement by : Amnat Wongsakhen

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supot S.

Supot Salamteh
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Wichan Choonharat

Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (8)

Date Received : Sep 11, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (8)-1

Page 1 of 3

Thai Plastic & Chemicals Public Co., Ltd.

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux) Spot Average	Guideline Limit Spot/Min Average	Comment
2	Spot : R&D Building : 1st Floor : R&D Office 1 (2)	2495453 (8)-1	10-Sep-24	Day time	1	1,350	400-500	Pass
		2495453 (8)-2	10-Sep-24	Day time	2	1,026	300	
		2495453 (8)-3	10-Sep-24	Day time	3	1,147	200	
3	Spot : R&D Building : 1st Floor : R&D Office 1 (3)	2495453 (8)-4	10-Sep-24	Day time	1	1,263	400-500	Pass
		2495453 (8)-5	10-Sep-24	Day time	2	1,227	300	
		2495453 (8)-6	10-Sep-24	Day time	3	1,283	200	
4	Spot : R&D Building : 1st Floor : R&D Office 1 (4)	2495453 (8)-7	10-Sep-24	Day time	1	1,113	400-500	Pass
		2495453 (8)-8	10-Sep-24	Day time	2	1,092	300	
		2495453 (8)-9	10-Sep-24	Day time	3	976	200	
5	Spot : R&D Building : 1st Floor : Instrument Analysis Room (1)	2495453 (8)-10	10-Sep-24	Day time	1	828	600-700	Pass
6	Spot : R&D Building : 1st Floor : Instrument Analysis Room (2)	2495453 (8)-11	10-Sep-24	Day time	1	733	600-700	Pass
7	Spot : R&D Building : 1st Floor : Instrument Analysis Room (3)	2495453 (8)-12	10-Sep-24	Day time	1	814	600-700	Pass
8	Spot : R&D Building : 1st Floor : Instrument Analysis Room (4)	2495453 (8)-13	10-Sep-24	Day time	1	841	600-700	Pass
9	Spot : R&D Building : 1st Floor : Spray Dryer room (1)	2495453 (8)-14	10-Sep-24	Day time	1	1,629	500-600	Pass
		2495453 (8)-15	10-Sep-24	Day time	2	1,919	300	
		2495453 (8)-16	10-Sep-24	Day time	3	1,489	200	
10	Spot : R&D Building : 1st Floor : Spray Dryer room (2)	2495453 (8)-17	10-Sep-24	Day time	1	1,447	500-600	Pass
		2495453 (8)-18	10-Sep-24	Day time	2	1,387	300	
		2495453 (8)-19	10-Sep-24	Day time	3	996	200	
11	Spot : R&D Building : 1st Floor : Thermal Analysis Room (1)	2495453 (8)-20	10-Sep-24	Day time	1	1,334	400-500	Pass
		2495453 (8)-21	10-Sep-24	Day time	2	1,487	300	
		2495453 (8)-22	10-Sep-24	Day time	3	1,313	200	
12	Spot : R&D Building : 1st Floor : Thermal Analysis Room (2)	2495453 (8)-23	10-Sep-24	Day time	1	841	400-500	Pass
13	Spot : R&D Building : 1st Floor : Physical Analysis Room (1)	2495453 (8)-24	10-Sep-24	Day time	1	507	400-500	Pass
14	Spot : R&D Building : 1st Floor : Physical Analysis Room (2)	2495453 (8)-25	10-Sep-24	Day time	1	525	400-500	Pass

Technical Management

Supot S
Supot Salamteh
Section Head

Approved by

Wichan Choonharat
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (8)

Date Received : Sep 11, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (8)-1

Page 2 of 3

Thai Plastic & Chemicals Public Co., Ltd.

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux) Spot Average	Guideline Limit Spot/Min Average	Comment
15	Spot : R&D Building : 1st Floor : Physical Analysis Room (3)	2495453 (8)-26	10-Sep-24	Day time	1	511	400-500	Pass
16	Spot : R&D Building : 1st Floor : Physical Analysis Room (4)	2495453 (8)-27	10-Sep-24	Day time	1	865	400-500	Pass
17	Spot : R&D Building : 1st Floor : Physical Analysis Room (5)	2495453 (8)-28	10-Sep-24	Day time	1	843	400-500	Pass
18	Spot : R&D Building : 1st Floor : WET Lab Analysis Room (1)	2495453 (8)-29	10-Sep-24	Day time	1	592	400-500	Pass
19	Spot : R&D Building : 1st Floor : WET Lab Analysis Room (2)	2495453 (8)-30	10-Sep-24	Day time	1	518	400-500	Pass
20	Spot : R&D Building : 1st Floor : WET Lab Analysis Room (3)	2495453 (8)-31	10-Sep-24	Day time	1	517	400-500	Pass
21	Spot : R&D Building : 1st Floor : WET Lab Analysis Room (4)	2495453 (8)-32	10-Sep-24	Day time	1	784	400-500	Pass
22	Spot : R&D Building : 1st Floor : WET Lab Analysis Room (5)	2495453 (8)-33	10-Sep-24	Day time	1	818	400-500	Pass
23	Spot : R&D Building : 1st Floor : WET Lab Analysis Room (6)	2495453 (8)-34	10-Sep-24	Day time	1	877	400-500	Pass
24	Spot : R&D Building : 1st Floor : WET Lab Analysis Room (7)	2495453 (8)-35	10-Sep-24	Day time	1	501	400-500	Pass
25	Spot : R&D Building : 1st Floor : WET Lab Analysis Room (8)	2495453 (8)-36	10-Sep-24	Day time	1	582	400-500	Pass
26	Spot : R&D Building : 1st Floor : WET Lab Analysis Room (9)	2495453 (8)-37	10-Sep-24	Day time	1	818	400-500	Pass
27	Spot : R&D Building : 1st Floor : Reactor Room (1)	2495453 (8)-38	10-Sep-24	Day time	1	431	400-500	Pass
28	Spot : R&D Building : 1st Floor : Reactor Room (2)	2495453 (8)-39	10-Sep-24	Day time	1	435	400-500	Pass
29	Spot : R&D Building : 1st Floor : Reactor Room (3)	2495453 (8)-40	10-Sep-24	Day time	1	796	400-500	Pass
30	Spot : R&D Building : 1st Floor : Reactor Room (4)	2495453 (8)-41	10-Sep-24	Day time	1	811	400-500	Pass

Technical Management

Supot S
Supot Salamteh
Section Head

Approved by

Wichan Choonharat
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (8)

Date Received : Sep 11, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (8)-1

Page 3 of 3

Thai Plastic & Chemicals Public Co., Ltd.										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
31	Spot : R&D Building : 1st Floor : Reactor Room (5)	2495453 (8)-42	10-Sep-24	Day time	1	667	-	400-500	-	Pass
32	Spot : R&D Building : 1st Floor : Reactor Room (6)	2495453 (8)-43	10-Sep-24	Day time	1	749	-	400-500	-	Pass
33	Area : R&D Building : 1st Floor : R&D Meeting Room RD 2	2495453 (8)-44	10-Sep-24	Day time	1	817	954	150	300	Pass
		2495453 (8)-45	10-Sep-24	Day time	2	930				
		2495453 (8)-46	10-Sep-24	Day time	3	1,074				
		2495453 (8)-47	10-Sep-24	Day time	4	1,130				
		2495453 (8)-48	10-Sep-24	Day time	5	886				
		2495453 (8)-49	10-Sep-24	Day time	6	886				

Measurement by : Amnat Wongsakhen

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supot S.
Supot Salamteh
Section Head

Approved by

Nichan Chuan
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (9)

Date Received : Sep 11, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (9)-1

Page 1 of 1

Thai Plastic & Chemicals Public Co., Ltd.										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : R&D Building : 2nd Floor : R&D Office 2 (1)	2495453 (9)-1	10-Sep-24	Day time	1	719	-	400-500	-	Pass
2	Spot : R&D Building : 2nd Floor : R&D Office 2 (2)	2495453 (9)-2	10-Sep-24	Day time	1	833	-	400-500	-	Pass
3	Spot : R&D Building : 2nd Floor : R&D Office 2 (3)	2495453 (9)-3	10-Sep-24	Day time	1	713	-	400-500	-	Pass
4	Spot : R&D Building : 2nd Floor : R&D Office 2 (4)	2495453 (9)-4	10-Sep-24	Day time	1	721	-	400-500	-	Pass
5	Spot : R&D Building : 2nd Floor : R&D Office 2 (5)	2495453 (9)-5	10-Sep-24	Day time	1	842	-	400-500	-	Pass
6	Spot : R&D Building : 2nd Floor : R&D Office 2 (6)	2495453 (9)-6	10-Sep-24	Day time	1	748	-	400-500	-	Pass
7	Spot : R&D Building : 2nd Floor : R&D Office 2 (7)	2495453 (9)-7	10-Sep-24	Day time	1	881	-	400-500	-	Pass
8	Spot : R&D Building : 2nd Floor : R&D Office 2 (8)	2495453 (9)-8	10-Sep-24	Day time	1	604	-	400-500	-	Pass
9	Spot : R&D Building : 2nd Floor : SEM&FTIR Room (1)	2495453 (9)-9	10-Sep-24	Day time	1	1,337	-	600-700	-	Pass
		2495453 (9)-10	10-Sep-24	Day time	2	1,448	-	300	-	
		2495453 (9)-11	10-Sep-24	Day time	3	1,416	-	200	-	
10	Spot : R&D Building : 2nd Floor : SEM&FTIR Room (2)	2495453 (9)-12	10-Sep-24	Day time	1	1,496	-	600-700	-	Pass
		2495453 (9)-13	10-Sep-24	Day time	2	1,568	-	300	-	
		2495453 (9)-14	10-Sep-24	Day time	3	1,577	-	200	-	

Measurement by : Amnat Wongsakhen

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supot S.
Supot Salamteh
Section Head

Approved by

Nichan Chuan
Wichan Choonharat
Assistant Manager

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Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (11)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (11)-1

Page 1 of 3

Thai Plastic & Chemicals Public Co., Ltd.										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : VCM 1&2 Building : 1st Floor : VCM 1 Office (1)	2495453 (11)-1	9-Sep-24	Day time	1	728	-	400-500	-	Pass
2	Spot : VCM 1&2 Building : 1st Floor : VCM 1 Office (2)	2495453 (11)-2	9-Sep-24	Day time	1	854	-	400-500	-	Pass
3	Spot : VCM 1&2 Building : 1st Floor : VCM 1 Office (3)	2495453 (11)-3	9-Sep-24	Day time	1	886	-	400-500	-	Pass
4	Spot : VCM 1&2 Building : 1st Floor : VCM 1 Office (4)	2495453 (11)-4	9-Sep-24	Day time	1	716	-	400-500	-	Pass
5	Spot : VCM 1&2 Building : 1st Floor : VCM 2 Office (1)	2495453 (11)-5	9-Sep-24	Day time	1	790	-	400-500	-	Pass
6	Spot : VCM 1&2 Building : 1st Floor : VCM 2 Office (2)	2495453 (11)-6	9-Sep-24	Day time	1	983	-	400-500	-	Pass
7	Spot : VCM 1&2 Building : 1st Floor : VCM 2 Office (3)	2495453 (11)-7	9-Sep-24	Day time	1	965	-	400-500	-	Pass
8	Spot : VCM 1&2 Building : 1st Floor : VCM 2 Office (4)	2495453 (11)-8	9-Sep-24	Day time	1	915	-	400-500	-	Pass
9	Spot : VCM 1&2 Building : 1st Floor : UT Office (1)	2495453 (11)-9	9-Sep-24	Day time	1	684	-	400-500	-	Pass
10	Spot : VCM 1&2 Building : 1st Floor : UT Office (2)	2495453 (11)-10	9-Sep-24	Day time	1	749	-	400-500	-	Pass
11	Spot : VCM 1&2 Building : 1st Floor : UT Office (3)	2495453 (11)-11	9-Sep-24	Day time	1	612	-	400-500	-	Pass
12	Spot : VCM 1&2 Building : 1st Floor : UT Office (4)	2495453 (11)-12	9-Sep-24	Day time	1	549	-	400-500	-	Pass
13	Spot : VCM 1&2 Building : 1st Floor : VCM 1 Dept. Manager Room	2495453 (11)-13	9-Sep-24	Day time	1	986	-	400-500	-	Pass
14	Spot : VCM 1&2 Building : 1st Floor : VCM 2 Dept. Manager Room	2495453 (11)-14	9-Sep-24	Day time	1	990	-	400-500	-	Pass
15	Area : VCM 1&2 Building : 1st Floor : VCM 2 Meeting Room	2495453 (11)-15	9-Sep-24	Day time	1	991	921	150	300	Pass
		2495453 (11)-16	9-Sep-24	Day time	2	997				
		2495453 (11)-17	9-Sep-24	Day time	3	869				
		2495453 (11)-18	9-Sep-24	Day time	4	992				
		2495453 (11)-19	9-Sep-24	Day time	5	810				
		2495453 (11)-20	9-Sep-24	Day time	6	869				

Technical Management

Supot S
Supot Salamteh
Section Head

Approved by

Nichan Chuan
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (11)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (11)-1

Page 2 of 3

Thai Plastic & Chemicals Public Co., Ltd.										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
16	Area : VCM 1&2 Building : 1st Floor : UT Meeting Room	2495453 (11)-21	9-Sep-24	Day time	1	1,490	1577	150	300	Pass
		2495453 (11)-22	9-Sep-24	Day time	2	1,856				
		2495453 (11)-23	9-Sep-24	Day time	3	1,686				
		2495453 (11)-24	9-Sep-24	Day time	4	1,436				
		2495453 (11)-25	9-Sep-24	Day time	5	1,544				
		2495453 (11)-26	9-Sep-24	Day time	6	1,449				
17	Area : VCM 1&2 Building : 1st Floor : VCM 1 Meeting Room	2495453 (11)-27	9-Sep-24	Day time	1	824	897	150	300	Pass
		2495453 (11)-28	9-Sep-24	Day time	2	972				
		2495453 (11)-29	9-Sep-24	Day time	3	962				
		2495453 (11)-30	9-Sep-24	Day time	4	847				
		2495453 (11)-31	9-Sep-24	Day time	5	819				
		2495453 (11)-32	9-Sep-24	Day time	6	958				
18	Spot : VCM 1&2 Building : 1st Floor : Office NT;VCM1 & VCM2_(1)	2495453 (11)-33	9-Sep-24	Day time	1	910	-	400-500	-	Pass
19	Spot : VCM 1&2 Building : 1st Floor : Office NT;VCM1 & VCM2_(2)	2495453 (11)-34	9-Sep-24	Day time	1	898	-	400-500	-	Pass
20	Spot : VCM 1&2 Building : 1st Floor : Office NT;VCM1 & VCM2_(3)	2495453 (11)-35	9-Sep-24	Day time	1	862	-	400-500	-	Pass
21	Spot : VCM 1&2 Building : 1st Floor : Office NT;VCM1 & VCM2_(4)	2495453 (11)-36	9-Sep-24	Day time	1	992	-	400-500	-	Pass
22	Spot : Control Room : 1st Floor : VCM 1 Plant (1)	2495453 (11)-37	9-Sep-24	Day time	1	417	-	400-500	-	Pass
		2495453 (11)-38	9-Sep-24	Night time	1	410	-	400-500	-	Pass
23	Spot : Control Room : 1st Floor : VCM 1 Plant (2)	2495453 (11)-39	9-Sep-24	Day time	1	497	-	400-500	-	Pass
		2495453 (11)-40	9-Sep-24	Night time	1	423	-	400-500	-	Pass
24	Spot : Control Room : 1st Floor : VCM 1 Plant (3)	2495453 (11)-41	9-Sep-24	Day time	1	589	-	400-500	-	Pass
		2495453 (11)-42	9-Sep-24	Night time	1	720	-	400-500	-	Pass
25	Spot : Control Room : 1st Floor : VCM 2 Plant (1)	2495453 (11)-43	9-Sep-24	Day time	1	646	-	400-500	-	Pass
		2495453 (11)-44	9-Sep-24	Night time	1	824	-	400-500	-	Pass
26	Spot : Control Room : 1st Floor : VCM 2 Plant (2)	2495453 (11)-45	9-Sep-24	Day time	1	729	-	400-500	-	Pass
		2495453 (11)-46	9-Sep-24	Night time	1	751	-	400-500	-	Pass

Technical Management

Supot S
Supot Salamteh
Section Head

Approved by

Nichan Chuan
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (11)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (11)-1

Page 3 of 3

Thai Plastic & Chemicals Public Co., Ltd.										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
27	Spot : Control Room : 1st Floor : VCM 2 Plant (3)	2495453 (11)-47	9-Sep-24	Day time	1	630	-	400-500	-	Pass
		2495453 (11)-48	9-Sep-24	Night time	1	976	-	400-500	-	Pass
28	Spot : Control Room : 1st Floor : UT Plant (1)	2495453 (11)-49	9-Sep-24	Day time	1	754	-	400-500	-	Pass
		2495453 (11)-50	9-Sep-24	Night time	1	744	-	400-500	-	Pass
29	Spot : Control Room : 1st Floor : UT Plant (2)	2495453 (11)-51	9-Sep-24	Day time	1	572	-	400-500	-	Pass
		2495453 (11)-52	9-Sep-24	Night time	1	510	-	400-500	-	Pass

Measurement by : Amnat Wongsakhen

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supot S.

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Section Head

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Wichan Choonharat

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Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (12)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (12)-1

Page 1 of 2

Thai Plastic & Chemicals Public Co., Ltd.										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : W/H & Logistic Building : 1st Floor : R/M Office (1)	2495453 (12)-1	9-Sep-24	Day time	1	611	-	400-500	-	Pass
2	Spot : W/H & Logistic Building : 1st Floor : R/M Office (2)	2495453 (12)-2	9-Sep-24	Day time	1	651	-	400-500	-	Pass
3	Spot : W/H & Logistic Building : 1st Floor : R/M Office (3)	2495453 (12)-3	9-Sep-24	Day time	1	752	-	400-500	-	Pass
4	Spot : W/H & Logistic Building : 1st Floor : R/M Office (4)	2495453 (12)-4	9-Sep-24	Day time	1	573	-	400-500	-	Pass
5	Spot : W/H & Logistic Building : 1st Floor : R/M Office (5)	2495453 (12)-5	9-Sep-24	Day time	1	789	-	400-500	-	Pass
6	Spot : W/H & Logistic Building : 1st Floor : R/M Office (6)	2495453 (12)-6	9-Sep-24	Day time	1	628	-	400-500	-	Pass
7	Spot : W/H & Logistic Building : 1st Floor : R/M Office (7)	2495453 (12)-7	9-Sep-24	Day time	1	577	-	400-500	-	Pass
8	Spot : W/H & Logistic Building : 1st Floor : R/M Office (8)	2495453 (12)-8	9-Sep-24	Day time	1	463	-	400-500	-	Pass
9	Spot : W/H & Logistic Building : 1st Floor : R/M Office (9)	2495453 (12)-9	9-Sep-24	Day time	1	523	-	400-500	-	Pass
10	Spot : W/H & Logistic Building : 1st Floor : W/H Office (1)	2495453 (12)-10	9-Sep-24	Day time	1	432	-	400-500	-	Pass
11	Spot : W/H & Logistic Building : 1st Floor : W/H Office (2)	2495453 (12)-11	9-Sep-24	Day time	1	489	-	400-500	-	Pass
12	Spot : W/H & Logistic Building : 1st Floor : W/H Office (3)	2495453 (12)-12	9-Sep-24	Day time	1	986	-	400-500	-	Pass
13	Spot : W/H & Logistic Building : 1st Floor : W/H Office (4)	2495453 (12)-13	9-Sep-24	Day time	1	802	-	400-500	-	Pass
14	Spot : W/H & Logistic Building : 1st Floor : W/H Office (5)	2495453 (12)-14	9-Sep-24	Day time	1	816	-	400-500	-	Pass
15	Spot : W/H & Logistic Building : 1st Floor : W/H Office (6)	2495453 (12)-15	9-Sep-24	Day time	1	902	-	400-500	-	Pass
16	Spot : W/H & Logistic Building : 1st Floor : W/H Office (7)	2495453 (12)-16	9-Sep-24	Day time	1	846	-	400-500	-	Pass

Technical Management

Supot S.

Supot Salamteah
Section Head

Approved by

Wichan Choonharat

Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (12)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (12)-1

Page 2 of 2

Thai Plastic & Chemicals Public Co., Ltd.

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
17	Spot : W/H & Logistic Building : 1st Floor : W/H Office (8)	2495453 (12)-17	9-Sep-24	Day time	1	835	-	400-500	-	Pass
18	Spot : W/H & Logistic Building : 1st Floor : W/H Office (9)	2495453 (12)-18	9-Sep-24	Day time	1	994	-	400-500	-	Pass

Measurement by: Amnat Wongsakhen

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

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P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (13)

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Page 1 of 1

Thai Plastic & Chemicals Public Co., Ltd.

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : W/H & Logistic Building : 2nd Floor : Engineering Office No.1 (1)	2495453 (13)-1	9-Sep-24	Day time	1	947	-	400-500	-	Pass
2	Spot : W/H & Logistic Building : 2nd Floor : Engineering Office No.1 (2)	2495453 (13)-2	9-Sep-24	Day time	1	974	-	400-500	-	Pass
3	Spot : W/H & Logistic Building : 2nd Floor : Engineering Office No.1 (3)	2495453 (13)-3	9-Sep-24	Day time	1	997	-	400-500	-	Pass
4	Spot : W/H & Logistic Building : 2nd Floor : Engineering Office No.1 (4)	2495453 (13)-4	9-Sep-24	Day time	1	945	-	400-500	-	Pass
5	Spot : W/H & Logistic Building : 2nd Floor : Engineering Office No.1 (5)	2495453 (13)-5	9-Sep-24	Day time	1	824	-	400-500	-	Pass
6	Spot : W/H & Logistic Building : 2nd Floor : Engineering Office No.1 (6)	2495453 (13)-6	9-Sep-24	Day time	1	977	-	400-500	-	Pass
7	Spot : W/H & Logistic Building : 2nd Floor : Engineering Office No.2 (1)	2495453 (13)-7	9-Sep-24	Day time	1	912	-	400-500	-	Pass
8	Spot : W/H & Logistic Building : 2nd Floor : Engineering Office No.2 (2)	2495453 (13)-8	9-Sep-24	Day time	1	948	-	400-500	-	Pass
9	Spot : W/H & Logistic Building : 2nd Floor : Engineering Office No.2 (3)	2495453 (13)-9	9-Sep-24	Day time	1	971	-	400-500	-	Pass
10	Spot : W/H & Logistic Building : 2nd Floor : Engineering Office No.2 (4)	2495453 (13)-10	9-Sep-24	Day time	1	975	-	400-500	-	Pass
11	Spot : W/H & Logistic Building : 2nd Floor : Engineering Office No.2 (5)	2495453 (13)-11	9-Sep-24	Day time	1	872	-	400-500	-	Pass
12	Spot : W/H & Logistic Building : 2nd Floor : Engineering Office No.2 (6)	2495453 (13)-12	9-Sep-24	Day time	1	902	-	400-500	-	Pass
13	Area : W/H & Logistic Building : 2nd Floor : Engineering Meeting Room	2495453 (13)-13	9-Sep-24	Day time	1	1,305	1290	150	300	Pass
		2495453 (13)-14	9-Sep-24	Day time	2	1,399				
		2495453 (13)-15	9-Sep-24	Day time	3	1,298				
		2495453 (13)-16	9-Sep-24	Day time	4	1,160				

Measurement by: Amnat Wongsakhen

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supot S
Supot Salamteh
Section Head

Approved by

Wichan Choonharat
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (18)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (18)-1

Page 1 of 3

Thai Plastic & Chemicals Public Co., Ltd.										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : อาคารปฏิบัติการเคมี : 1st Floor : Chemist Room (1)	2495453 (18)-1	9-Sep-24	Day time	1	223	206	100	200	Pass
		2495453 (18)-2	9-Sep-24	Day time	2	204				
		2495453 (18)-3	9-Sep-24	Day time	3	205				
		2495453 (18)-4	9-Sep-24	Day time	4	194				
2	Area : อาคารปฏิบัติการเคมี : 1st Floor : ห้อง Retained Sample Room	2495453 (18)-5	9-Sep-24	Night time	1	204	205	100	200	Pass
		2495453 (18)-6	9-Sep-24	Night time	2	203				
		2495453 (18)-7	9-Sep-24	Night time	3	204				
		2495453 (18)-8	9-Sep-24	Night time	4	209				
3	Spot : อาคารปฏิบัติการเคมี : 1st Floor : Clerk Room : โต๊ะคอมพิวเตอร์ 1	2495453 (18)-9	9-Sep-24	Day time	1	408	-	400-500	-	Pass
4	Spot : อาคารปฏิบัติการเคมี : 1st Floor : OSBL Lab (1)	2495453 (18)-10	9-Sep-24	Day time	1	653	-	400-500	-	Pass
5	Spot : อาคารปฏิบัติการเคมี : 1st Floor : OSBL Lab (2)	2495453 (18)-11	9-Sep-24	Day time	1	592	-	400-500	-	Pass
6	Spot : อาคารปฏิบัติการเคมี : 1st Floor : OSBL Lab (3)	2495453 (18)-12	9-Sep-24	Day time	1	461	-	400-500	-	Pass
7	Spot : อาคารปฏิบัติการเคมี : 1st Floor : OSBL Lab (4)	2495453 (18)-13	9-Sep-24	Day time	1	596	-	400-500	-	Pass
8	Spot : อาคารปฏิบัติการเคมี : 1st Floor : R/M Lab (1)	2495453 (18)-14	9-Sep-24	Day time	1	799	-	600-700	-	Pass
9	Spot : อาคารปฏิบัติการเคมี : 1st Floor : R/M Lab (2)	2495453 (18)-15	9-Sep-24	Day time	1	760	-	600-700	-	Pass
10	Area : อาคารปฏิบัติการเคมี : 1st Floor : QA Meeting Room (1)	2495453 (18)-16	9-Sep-24	Day time	1	482	508	150	300	Pass
		2495453 (18)-17	9-Sep-24	Day time	2	552				
		2495453 (18)-18	9-Sep-24	Day time	3	539				
		2495453 (18)-19	9-Sep-24	Day time	4	457				
11	Spot : อาคารปฏิบัติการเคมี : 1st Floor : VCM Lab (1)	2495453 (18)-20	9-Sep-24	Day time	1	536	-	400-500	-	Pass
		2495453 (18)-21	9-Sep-24	Night time	1	501	-	400-500	-	Pass
12	Spot : อาคารปฏิบัติการเคมี : 1st Floor : VCM Lab (2)	2495453 (18)-22	9-Sep-24	Day time	1	529	-	400-500	-	Pass
		2495453 (18)-23	9-Sep-24	Night time	1	571	-	400-500	-	Pass
13	Spot : อาคารปฏิบัติการเคมี : 1st Floor : VCM Lab (3)	2495453 (18)-24	9-Sep-24	Day time	1	670	-	400-500	-	Pass
		2495453 (18)-25	9-Sep-24	Night time	1	546	-	400-500	-	Pass

Technical Management

Supot Salamteah
Section Head

Approved by

Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (18)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (18)-1

Page 2 of 3

Thai Plastic & Chemicals Public Co., Ltd.										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
14	Spot : อาคารปฏิบัติการเคมี : 1st Floor : VCM Lab (4)	2495453 (18)-26	9-Sep-24	Day time	1	686	-	400-500	-	Pass
		2495453 (18)-27	9-Sep-24	Night time	1	641	-	400-500	-	Pass
15	Spot : อาคารปฏิบัติการเคมี : 1st Floor : VCM Lab (5)	2495453 (18)-28	9-Sep-24	Day time	1	603	-	400-500	-	Pass
		2495453 (18)-29	9-Sep-24	Night time	1	635	-	400-500	-	Pass
16	Spot : อาคารปฏิบัติการเคมี : 1st Floor : VCM Lab (6)	2495453 (18)-30	9-Sep-24	Day time	1	596	-	400-500	-	Pass
		2495453 (18)-31	9-Sep-24	Night time	1	707	-	400-500	-	Pass
17	Spot : อาคารปฏิบัติการเคมี : 1st Floor : QC Office (1)	2495453 (18)-32	9-Sep-24	Day time	1	490	-	400-500	-	Pass
18	Spot : อาคารปฏิบัติการเคมี : 1st Floor : QC Office (2)	2495453 (18)-33	9-Sep-24	Day time	1	513	-	400-500	-	Pass
19	Spot : อาคารปฏิบัติการเคมี : 1st Floor : โต๊ะคอมพิวเตอร์ QA ENGINEER 2	2495453 (18)-34	9-Sep-24	Day time	1	404	-	400-500	-	Pass
20	Spot : อาคารปฏิบัติการเคมี : 1st Floor : โต๊ะคอมพิวเตอร์ QA ENGINEER 1	2495453 (18)-35	9-Sep-24	Day time	1	425	-	400-500	-	Pass
21	Spot : อาคารปฏิบัติการเคมี : 1st Floor : ห้องเครื่องมือ GC (1)	2495453 (18)-36	9-Sep-24	Night time	1	874	-	400-500	-	Pass
22	Spot : อาคารปฏิบัติการเคมี : 1st Floor : ห้องเครื่องมือ GC (2)	2495453 (18)-37	9-Sep-24	Night time	1	675	-	400-500	-	Pass
23	Spot : อาคารปฏิบัติการเคมี : 1st Floor : ICP & AAS (1)	2495453 (18)-38	9-Sep-24	Night time	1	983	-	400-500	-	Pass
24	Spot : อาคารปฏิบัติการเคมี : 1st Floor : ICP & AAS (2)	2495453 (18)-39	9-Sep-24	Night time	1	692	-	400-500	-	Pass
25	Spot : อาคารปฏิบัติการเคมี : 1st Floor : QA Department Manager	2495453 (18)-40	9-Sep-24	Day time	1	458	-	400-500	-	Pass
27	Spot : อาคารปฏิบัติการเคมี : 1st Floor : โต๊ะผู้จัดการแผนก	2495453 (18)-41	9-Sep-24	Day time	1	440	-	400-500	-	Pass
28	Spot : อาคารปฏิบัติการเคมี : 1st Floor : โต๊ะผู้จัดการแผนก	2495453 (18)-42	9-Sep-24	Day time	1	542	-	400-500	-	Pass
29	Area : อาคารปฏิบัติการเคมี : 1st Floor : ห้องประชุม QA 2	2495453 (18)-43	9-Sep-24	Day time	1	645	1328	150	300	Pass
		2495453 (18)-44	9-Sep-24	Day time	2	2,010				
30	Spot : อาคารปฏิบัติการเคมี : 1st Floor : Clerk Room : โต๊ะคอมพิวเตอร์ 2	2495453 (18)-45	9-Sep-24	Day time	1	404	-	400-500	-	Pass

Technical Management

Supot Salamteah
Section Head

Approved by

Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 2495453 (18)

Date Received : Sep 10, 2024

Date Reported : Sep 12, 2024

Report Number: 2495453 (18)-1

Page 3 of 3

Thai Plastic & Chemicals Public Co., Ltd.										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
31	Spot : อาคารปฏิบัติการเคมี : 1st Floor : Clerk Room : เครื่องคอมพิวเตอร์ 3	2495453 (18)-46	9-Sep-24	Day time	1	411	-	400-500	-	Pass
32	Area : อาคารปฏิบัติการเคมี : 1st Floor : Carler gas Room	2495453 (18)-47	9-Sep-24	Day time	1	593	566	100	200	Pass
		2495453 (18)-48	9-Sep-24	Day time	2	538				
33	Spot : อาคารปฏิบัติการเคมี : 1st Floor : Hot Room : เครื่องชั่ง	2495453 (18)-49	9-Sep-24	Day time	1	959	-	300-400	-	Pass
34	Spot : อาคารปฏิบัติการเคมี : 1st Floor : TPR Lab Room CPS	2495453 (18)-50	9-Sep-24	Day time	1	498	-	400-500	-	Pass
35	Spot : อาคารปฏิบัติการเคมี : 1st Floor : TPR Lab Room MS 3000	2495453 (18)-51	9-Sep-24	Day time	1	482	-	400-500	-	Pass
36	Spot : อาคารปฏิบัติการเคมี : 1st Floor : TPR Lab Room : เครื่องชั่ง	2495453 (18)-52	9-Sep-24	Day time	1	553	-	300-400	-	Pass
37	Spot : อาคารปฏิบัติการเคมี : 1st Floor : TPR Lab Room : โต๊ะปฏิบัติการ 1	2495453 (18)-53	9-Sep-24	Day time	1	513	-	400-500	-	Pass
38	Spot : อาคารปฏิบัติการเคมี : 1st Floor : TPR Lab Room : โต๊ะปฏิบัติการ 2	2495453 (18)-54	9-Sep-24	Day time	1	583	-	400-500	-	Pass

Measurement by : Amnat Wongsakhen

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 390 dated February 21 B.E.2561 (2018)

Technical Management

Supot S
Supot Salamteh
Section Head

Approved by

Wichan Ch
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand 21150

P/O :

Project Name : Environmental Testing

Project Location:

Lot ID: 24113544 (1)

Date Received : Oct 03, 2024

Date Reported : Oct 02, 2024

Report Number: 24113544 (1)-1

Page 1 of 1

Thai Plastic & Chemicals Public Co., Ltd.										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
38	Area : Maintenance Shop : 1st Floor : Store Area	24113544 (1)-1	1-Oct-24	Day time	1	605	284	100	200	Pass
		24113544 (1)-2	1-Oct-24	Day time	2	235				
		24113544 (1)-3	1-Oct-24	Day time	3	156				
		24113544 (1)-4	1-Oct-24	Day time	4	175				
		24113544 (1)-5	1-Oct-24	Day time	5	228				
		24113544 (1)-6	1-Oct-24	Day time	6	302				

Measurement by : Chanon Booncheun

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 390 dated February 21 B.E.2561 (2018)

Technical Management

Supot S
Supot Salamteh
Section Head

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Wichan Ch
Wichan Choonharat
Assistant Manager

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คุณภาพอากาศภายในสถานประกอบการ



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2470003

Date Received : Jul 10, 2024

Date Reported : Jul 18, 2024

Report Number : 3029728-1

Page 1 of 2

Sample Number 2470003-1
Sampled Date Jul 09, 2024
Sample Description Air Quality
Location Worker in VCM 1 Plant
Personal Sampling คุณณัฏฐพร ศาส์วงษ์
Date Analysis Commenced Jul 12, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Ethylene dichloride	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	50	10	NIOSH (1994), 1003	Bangkok
Vinyl chloride	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	1	1	NIOSH (1994), 1007	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances
Dated August 3, B.E. 2560 (2017)

2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (ACGIH) (2024)

**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

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Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2470003

Date Received : Jul 10, 2024

Date Reported : Jul 18, 2024

Report Number : 3029728-1

Page 2 of 2

Sample Number 2470003-2
Sampled Date Jul 09, 2024
Sample Description Air Quality
Location Worker in VCM 2 Plant
Personal Sampling คุณณัฏฐพร ศาส์วงษ์
Date Analysis Commenced Jul 12, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Ethylene dichloride	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	50	10	NIOSH (1994), 1003	Bangkok
Vinyl chloride	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	1	1	NIOSH (1994), 1007	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances
Dated August 3, B.E. 2560 (2017)

2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (ACGIH) (2024)

**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

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Orawan R.

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106786
Date Received : Oct 09, 2024
Date Reported : Oct 18, 2024
Report Number : 3112255-1

Page 1 of 1

Sample Number 24106786-2
Sampled Date Oct 08, 2024
Sample Description Air Quality
Location Worker In VCM 2 Plant
Personal Sampling รวบรวมฝุ่นละออง
Date Analysis Commenced Oct 11, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 757 mmHg
Atmospheric Temperature 31.4 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Ethylene dichloride	08:30 AM - 04:30 PM	ppm	-	0.10	<0.10	50	10	NIOSH (1994), 1003	Bangkok
Vinyl chloride	08:30 AM - 04:30 PM	ppm	-	0.10	<0.10	1	1	NIOSH (1994), 1007	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices.(ACGIH) (2024)
**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

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

Approved by

Orawan R.
Orawan Rakyong
Scientist (3)

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S:\Report\Air_Working_20L\pt (2:43PM)



Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469973
Date Received : Jul 10, 2024
Date Reported : Jul 24, 2024
Report Number : 3029646-1

Page 1 of 12

Sample Number 2469973-1
Sampled Date Jul 09, 2024
Sample Description Air Quality
Location Induration Unit Section 800 VCM1 Plant
Date Analysis Commenced Jul 12, 2024
Condition of Sample Drawn into one amber plastic bottle and two sorbent tubes, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Chlorine	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	1(Ceiling)	0.1	Based on OSHA, ID 101	Bangkok
Ethylene dichloride	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	50	10	NIOSH (1994), 1003	Bangkok
Hydrogen chloride	09:00 AM - 05:00 PM	ppm	-	0.05	<0.05	5(Ceiling)	2(Ceiling)	Based on OSHA, ID-174-SG	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices.(ACGIH) (2024)
**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

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

Approved by

Orawan R.
Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2469973

Date Received : Jul 10, 2024

Date Reported : Jul 24, 2024

Report Number : 3029646-1

Page 2 of 12

Sample Number 2469973-2
Sampled Date Jul 09, 2024
Sample Description Air Quality
Location Oxychlorination Section 200 VCM1 Plant
Date Analysis Commenced Jul 12, 2024
Condition of Sample Drawn into two sorbent tubes, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Hydrogen chloride	09:00 AM - 05:00 PM	ppm	-	0.05	<0.05	5(Ceiling)	2(Ceiling)	Based on OSHA, ID-174-SG	Bangkok
Vinyl chloride	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	1	1	NIOSH (1994), 1007	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices.(ACGIH) (2024)

**Recommended concentration ; Appendix B : Particles (insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.

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21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2469973

Date Received : Jul 10, 2024

Date Reported : Jul 24, 2024

Report Number : 3029646-1

Page 3 of 12

Sample Number 2469973-3
Sampled Date Jul 09, 2024
Sample Description Air Quality
Location Near Storage Tank (M-FA702A/B) VCM1 Plant
Date Analysis Commenced Jul 12, 2024
Condition of Sample Drawn into two sorbent tubes, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Hydrogen chloride	09:00 AM - 05:00 PM	ppm	-	0.05	<0.05	5(Ceiling)	2(Ceiling)	Based on OSHA, ID-174-SG	Bangkok
Vinyl chloride	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	1	1	NIOSH (1994), 1007	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices.(ACGIH) (2024)

**Recommended concentration ; Appendix B : Particles (insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Thai Plastic & Chemicals Public Co., Ltd.
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21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469973
Date Received : Jul 10, 2024
Date Reported : Jul 24, 2024
Report Number : 3029646-1

Page 4 of 12

Sample Number 2469973-4
Sampled Date Jul 09, 2024
Sample Description Air Quality
Location VCM Purification Unit Section 500 VCM1 Plant
Date Analysis Commenced Jul 12, 2024
Condition of Sample Drawn into two sorbent tubes, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Hydrogen chloride	09:00 AM - 05:00 PM	ppm	-	0.05	<0.05	5(Ceiling)	2(Ceiling)	Based on OSHA, ID-174-SG	Bangkok
Vinyl chloride	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	1	1	NIOSH (1994), 1007	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (ACGIH) (2024)
**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469973
Date Received : Jul 10, 2024
Date Reported : Jul 24, 2024
Report Number : 3029646-1

Page 5 of 12

Sample Number 2469973-5
Sampled Date Jul 09, 2024
Sample Description Air Quality
Location EDC Cracking Unit Section 400 VCM1 Plant
Date Analysis Commenced Jul 12, 2024
Condition of Sample Drawn into two sorbent tubes, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Hydrogen chloride	09:00 AM - 05:00 PM	ppm	-	0.05	<0.05	5(Ceiling)	2(Ceiling)	Based on OSHA, ID-174-SG	Bangkok
Vinyl chloride	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	1	1	NIOSH (1994), 1007	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (ACGIH) (2024)
**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2469973

Date Received : Jul 10, 2024

Date Reported : Jul 24, 2024

Report Number : 3029646-1

Page 6 of 12

Sample Number 2469973-6
Sampled Date Jul 09, 2024
Sample Description Air Quality
Location In front of VCM 1 Control Room
Date Analysis Commenced Jul 12, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Ethylene dichloride	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	50	10	NIOSH (1994), 1003	Bangkok
Vinyl chloride	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	1	1	NIOSH (1994), 1007	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices.(ACGIH) (2024)

**Recommended concentration ; Appendix B : Particles (insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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Orawan R.

Orawan Rakhyong
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21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2469973

Date Received : Jul 10, 2024

Date Reported : Jul 24, 2024

Report Number : 3029646-1

Page 7 of 12

Sample Number 2469973-7
Sampled Date Jul 09, 2024
Sample Description Air Quality
Location In front of VCM 2 Control Room
Date Analysis Commenced Jul 12, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Ethylene dichloride	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	50	10	NIOSH (1994), 1003	Bangkok
Vinyl chloride	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	1	1	NIOSH (1994), 1007	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices.(ACGIH) (2024)

**Recommended concentration ; Appendix B : Particles (insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

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Approved by

Orawan R.

Orawan Rakhyong
Scientist (3)

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21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469973
Date Received : Jul 10, 2024
Date Reported : Jul 24, 2024
Report Number : 3029646-1

Page 8 of 12

Sample Number 2469973-8
Sampled Date Jul 09, 2024
Sample Description Air Quality
Location C2 Compressor VCM2
Date Analysis Commenced Jul 12, 2024
Condition of Sample Drawn into one amber plastic bottle, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Chlorine	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	1(Ceiling)	0.1	Based on OSHA, ID 101	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (ACGIH) (2024)
**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

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

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 2469973
Date Received : Jul 10, 2024
Date Reported : Jul 24, 2024
Report Number : 3029646-1

Page 9 of 12

Sample Number 2469973-9
Sampled Date Jul 09, 2024
Sample Description Air Quality
Location Oxychlorination Section 200 VCM2
Date Analysis Commenced Jul 12, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Hydrogen chloride	09:00 AM - 05:00 PM	ppm	-	0.05	<0.05	5(Ceiling)	2(Ceiling)	Based on OSHA, ID-174-SG	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (ACGIH) (2024)
**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

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

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2469973

Date Received : Jul 10, 2024

Date Reported : Jul 24, 2024

Report Number : 3029646-1

Page 10 of 12

Sample Number 2469973-10
Sampled Date Jul 09, 2024
Sample Description Air Quality
Location Induration Unit Section 800 VCM2
Date Analysis Commenced Jul 12, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Alr Testing									
Hydrogen chloride	09:00 AM - 05:00 PM	ppm	-	0.05	<0.05	5(Ceiling)	2(Ceiling)	Based on OSHA, ID-174-SG	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices.(ACGIH) (2024)

**Recommended concentration ; Appendix B : Particles (insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

Approved by

Orawan R.

Orawan Rakhyong
Scientist (3)

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21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2469973

Date Received : Jul 10, 2024

Date Reported : Jul 24, 2024

Report Number : 3029646-1

Page 11 of 12

Sample Number 2469973-11
Sampled Date Jul 09, 2024
Sample Description Air Quality
Location EDC Purification Unit Section 300 VCM2
Date Analysis Commenced Jul 12, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Alr Testing									
Hydrogen chloride	09:00 AM - 05:00 PM	ppm	-	0.05	<0.05	5(Ceiling)	2(Ceiling)	Based on OSHA, ID-174-SG	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices.(ACGIH) (2024)

**Recommended concentration ; Appendix B : Particles (insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

Approved by

Orawan R.

Orawan Rakhyong
Scientist (3)

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Client : Thal Plastic & Chemicals Public Co., Ltd.

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21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 2469973

Date Received : Jul 10, 2024

Date Reported : Jul 24, 2024

Report Number : 3029646-1

Page 12 of 12

Sample Number 2469973-12
Sampled Date Jul 09, 2024
Sample Description Air Quality
Location Process Storage Tank
Date Analysis Commenced Jul 12, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 756 mmHg
Atmospheric Temperature 31.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Vinyl chloride	09:00 AM - 05:00 PM	ppm	-	0.10	<0.10	1	1	NIOSH (1994), 1007	Bangkok

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)

2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (ACGIH) (2024)

**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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

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S:\Reports\Air_Working_2GL.rpt (24 SPH)



Analysis / Test Report

Client : Thal Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106790

Date Received : Oct 09, 2024

Date Reported : Oct 23, 2024

Report Number : 3112128-1

Page 1 of 6

Sample Number 24106790-7
Sampled Date Oct 08, 2024
Sample Description Air Quality
Location In front of VCM 2 Control Room
Date Analysis Commenced Oct 11, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 758 mmHg
Atmospheric Temperature 31.4 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Ethylene dichloride	08:30 AM - 04:30 PM	ppm	-	0.10	<0.10	50	10	NIOSH (1994), 1003	Bangkok
Vinyl chloride	08:30 AM - 04:30 PM	ppm	-	0.10	<0.10	1	1	NIOSH (1994), 1007	Bangkok

Guideline :

1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)

2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (ACGIH) (2024)

**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Thal Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106790

Date Received : Oct 09, 2024

Date Reported : Oct 23, 2024

Report Number : 3112128-1

Page 2 of 6

Sample Number 24106790-8
Sampled Date Oct 08, 2024
Sample Description Air Quality
Location C12 Compressor VCM2
Date Analysis Commenced Oct 11, 2024
Condition of Sample Drawn into one amber plastic bottle, refrigerated
Barometric Pressure 758 mmHg
Atmospheric Temperature 31.4 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Chlorine	08:30 AM - 04:30 PM	ppm	-	0.10	<0.10	1(Ceiling)	0.1	Based on OSHA, ID 101	Bangkok

Guideline :

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (ACGIH) (2024)

**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

Approved by

Orawan R.

Orawan Rakying
Scientist (3)

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Analysis / Test Report

Client : Thal Plastic & Chemicals Public Co., Ltd.

8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106790

Date Received : Oct 09, 2024

Date Reported : Oct 23, 2024

Report Number : 3112128-1

Page 3 of 6

Sample Number 24106790-9
Sampled Date Oct 08, 2024
Sample Description Air Quality
Location Oxychlorination Section 200 VCM2
Date Analysis Commenced Oct 11, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 758 mmHg
Atmospheric Temperature 31.4 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Hydrogen chloride	08:30 AM - 04:30 PM	ppm	-	0.05	<0.05	5(Ceiling)	2(Ceiling)	Based on OSHA, ID-174-SG	Bangkok

Guideline :

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (ACGIH) (2024)

**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

Approved by

Orawan R.

Orawan Rakying
Scientist (3)

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Analysis / Test Report

Client : Thal Plastic & Chemicals Public Co., Ltd.
8, Map Ta Phut Industrial Estate I-1 Road, Maptaphud, Muang, Rayong Thailand
21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106790
Date Received : Oct 09, 2024
Date Reported : Oct 23, 2024
Report Number : 3112128-1

Page 4 of 6

Sample Number 24106790-10
Sampled Date Oct 08, 2024
Sample Description Air Quality
Location Incineration Unit Section 800 VCM2
Date Analysis Commenced Oct 11, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 758 mmHg
Atmospheric Temperature 31.4 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Hydrogen chloride	08:30 AM - 04:30 PM	ppm	-	0.05	<0.05	5(Ceiling)	2(Ceiling)	Based on OSHA, ID-174-SG	Bangkok

Guideline :
Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (ACGIH) (2024)
**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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21150
P/O : PMM-23-14
Project Name : Environmental Testing
Project Location :

Lot ID: 24106790
Date Received : Oct 09, 2024
Date Reported : Oct 23, 2024
Report Number : 3112128-1

Page 5 of 6

Sample Number 24106790-11
Sampled Date Oct 08, 2024
Sample Description Air Quality
Location EDC Purification Unit Section 300 VCM2
Date Analysis Commenced Oct 11, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 758 mmHg
Atmospheric Temperature 31.4 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Hydrogen chloride	08:30 AM - 04:30 PM	ppm	-	0.05	<0.05	5(Ceiling)	2(Ceiling)	Based on OSHA, ID-174-SG	Bangkok

Guideline :
Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (ACGIH) (2024)
**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

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21150

P/O : PMM-23-14

Project Name : Environmental Testing

Project Location :

Lot ID: 24106790

Date Received : Oct 09, 2024

Date Reported : Oct 23, 2024

Report Number : 3112128-1

Page 6 of 6

Sample Number 24106790-12
Sampled Date Oct 08, 2024
Sample Description Air Quality
Location Process Storage Tank
Date Analysis Commenced Oct 11, 2024
Condition of Sample Drawn into one sorbent tube, refrigerated
Barometric Pressure 758 mmHg
Atmospheric Temperature 31.4 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Vinyl chloride	08:30 AM - 04:30 PM	ppm	-	0.10	<0.10	1	1	NIOSH (1994), 1007	Bangkok

Guideline :

Guideline : 1.) Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances
Dated August 3, B.E. 2560 (2017)

2.) The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values
and Biological Exposure Indices (ACGIH) (2024)

**Recommended concentration ; Appendix B : Particles (Insoluble or poorly soluble)

Sampled By : Nantawat Sarin

Remark :

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

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Approved by

Orawan R.

Orawan Rakyong
Scientist (3)

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1/6 ซอยรามคำแหง 145 แขวงสะพานสูง เขตสะพานสูง กรุงเทพมหานคร 10240 Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

Page 1 of 1

TEST REPORT

Analysis No. : R24-3477 Report Date : 03/10/24
Received Date : 27/09/24 Analysis Date : 01/10/24
Customer : Technical Division of Thai Environmental Technic Limited Job No. : S670016/Sep/8
For PTT Global Chemical Public Company Limited. Sampling By : TET
Address : 19, Map Ta Phut Industrial Estate, Rong Pui Road, Type of Sample : Working Area
Map Ta Phut, Mueang, Rayong 21150
Contact : *

Sample No.	Sampling point	Parameter	Unit	Sampling Date	Result	Standard (TWA)	Analysis Date
2409-AW1270 (1/2)	ขณะขนถ่ายสารเคมี	Vinyl Chloride	ppm	26/09/24	< 0.0031	1	01/10/24
2409-AW1270 (2/2)	บริเวณทางเดินเรือ (Jetty 1)	Vinyl Chloride	ppm	26/09/24	< 0.0031	1	01/10/24

Method Vinyl Chloride - Solid Sorbent Tube, GC/FID (NIOSH 1007, Issue 2 Aug 1990)

Standard (1) Notification of the Department of Labour Protection and Welfare (2017) (B.E. 2560) (TLV-TWA)

(2) American Conference of Governmental Industrial Hygienists, ACGIH (TLV-TWA)

Reviewed by 
Ms. Wareut Prachumdaeng
Chief of Laboratory
23/10/24

Approved by 
Mrs. Pongtip Pethshee
Laboratory Manager
23/10/24

END OF REPORT



Thai Environmental Technic Limited
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

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1/6 ซอยรามคำแหง 145 แขวงสะพานสูง เขตสะพานสูง กรุงเทพมหานคร 10240 Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

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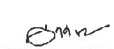
TEST REPORT


Analysis No. : R24-3373 Report Date : 25/09/24
Received Date : 19/09/24 Analysis Date : 19-20/09/24
Customer : Technical Division of Thai Environmental Technic Limited Job No. : S670016/Sep/9
For PTT Global Chemical Public Company Limited. Sampling By : TET
Address : 19, Map Ta Phut Industrial Estate, Rong Pui Road, Type of Sample : Working Area
Map Ta Phut, Mueang, Rayong 21150
Contact : *

Sample No.	Sampling point	Parameter	Unit	Sampling Date	Result	Standard	Analysis Date
2409-AW0833 (1/2)	ขณะขนถ่ายสารเคมี	Ethylene Dichloride	ppm	18/09/24	< 0.0012	50	19-20/09/24
2409-AW0833 (2/2)	บริเวณทางเดินเรือ (Jetty 2)	Ethylene Dichloride	ppm	18/09/24	< 0.0012	50	19-20/09/24

Method Ethylene Dichloride - Solid Sorbent Tube, GC/FID (NIOSH 1003, Issue 3 Mar 2003)

Standard Notification of the Department of Labour Protection and Welfare (2017) (B.E. 2560) (TLV-TWA)

Reviewed by 
Ms. Wareut Prachumdaeng
Chief of Laboratory
23/09/24

Approved by 
Mrs. Pongtip Pethshee
Laboratory Manager
23/09/24

END OF REPORT

- REPORTED RESULTS REFER TO SUBMITTED SAMPLE(S) ONLY
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Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

TEST REPORT

Analysis No. : R24-4343
Report Date : 09/12/24
Received Date : 02/12/24
Analysis Date : 04-06/12/24
Customer : Technical Division of Thai Environmental Technic Limited
Job No. : S670016/Nov/1
For : PTT Global Chemical Public Company Limited
Sampling By : TET
Address : 19, Map Ta Phut Industrial Estate, Rong Pui Road,
Map Ta Phut, Mueang, Rayong 21150
Type of Sample : Working Area
Contact : *

Sample No.	Sampling point	Parameter	Unit	Sampling Date	Result	Standard	Analysis Date
2412-AW0057 (1/2)	ขณะขนถ่ายสารเคมี	Ethylene Dichloride	ppm	30/11/24	< 0.0012	50	04-06/12/24
2412-AW0057 (2/2)	บริเวณหัวเขื่อนเรือ Jetty 2	Ethylene Dichloride	ppm	30/11/24	< 0.0012	50	04-06/12/24

Method : Ethylene Dichloride - Solid Sorbent Tube, GC/FID (MOSH 1003, Issue 3, Mar 2003)

Standard : Notification of the Department of Labour Protection and Welfare (2017) (B.E. 2560) (TLV-TWA)

Reviewed by

Ms. Wareut Prachumsang
Chief of Laboratory
09/12/24



Approved by

Mrs. Pongp Pethshee
Laboratory Manager
09/12/24

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E-mail : admin@tet1995.com

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Tel : 0-2373-7799 (Auto) Fax : 0-2373-7979

TEST REPORT

Analysis No. : R24-3562
Report Date : 15/10/24
Received Date : 07/10/24
Analysis Date : 08/10/24
Customer : Technical Division of Thai Environmental Technic Limited
Job No. : S670016/Oct/2
For : PTT Global Chemical Public Company Limited
Sampling By : TET
Address : 19, Map Ta Phut Industrial Estate, Rong Pui Road,
Map Ta Phut, Mueang, Rayong 21150
Type of Sample : Working Area
Contact : *

Sample No.	Sampling point	Parameter	Unit	Sampling Date	Result	Standard	Analysis Date
2410-AW0183 (1/2)	ขณะขนถ่ายสารเคมี	Vinyl Chloride	ppm	04/10/24	< 0.0031	1	08/10/24
2410-AW0183 (2/2)	บริเวณท่าเรือ Jetty 1	Vinyl Chloride	ppm	04/10/24	< 0.0031	1	08/10/24

Method : Vinyl Chloride - Solid Sorbent Tube, GC/FID (MOSH 1007, Issue 2, Aug 1994)

Standard : (1) Notification of the Department of Labour Protection and Welfare (2017) (B.E. 2560) (TLV-TWA)

(2) American Conference Governmental Industrial Hygienists, ACGIH (TLV-TWA)

Reviewed by

Ms. Wareut Prachumsang
Chief of Laboratory
15/10/24



Approved by

Mrs. Pongp Pethshee
Laboratory Manager
15/10/24

END OF REPORT

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ข้อมูลการสอบเทียบเครื่องมือ (Calibration Data Sheets)



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รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0261	2-Jul-24	2-Jan-25	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0272	2-Jul-24	2-Jan-25	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0551	3-Jul-24	3-Jan-25	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	BKK_FS1064	2-Jul-24	2-Jan-25	6
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0398	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0294	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0397	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_FS0187	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	Digital Balance	RYG_EN0001	22-Feb-24	22-Feb-25	12
Ambient	Total Suspended Particulate	High Volume	RYG_FS0663	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_FS0394	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_FS0182	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_FS0176	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	RYG_EN0001	22-Feb-24	22-Feb-25	12
Ambient	Hydrogen Chloride	Field Rotameter	RYG_FS0627	2-Oct-24	2-Jan-25	3
Ambient	Hydrogen Chloride	Ion Chromatography	BKK_EN0069	12-Jan-24	12-Jan-25	12
Ambient	Chlorine	Field Rotameter	RYG_FS0196	2-Oct-24	2-Jan-25	3
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0545	21-Jul-23	21-Jan-25	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	BKK_FS0141	20-Aug-24	20-Feb-26	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0087	7-Oct-24	7-Apr-26	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0648	20-Jun-23	20-Dec-24	18
Ambient	Vinyl Chloride	GC-MSD	RYG_EN0136	5-Jan-24	4-Jul-25	18
Ambient	Ethylene Dichloride	GC-MSD	RYG_EN0136	5-Jan-24	4-Jul-25	18
Stack	Chlorine	Console Control Unit	BKK_FS0556	10-Jul-24	10-Jan-25	6
Stack	Chlorine	Console Control Unit	BKK_FS0518	10-Jul-24	10-Jan-25	6
Stack	Chlorine	Pitot Tube	BKK_FS0560	10-Jul-24	10-Jan-25	6
Stack	Chlorine	Pitot Tube	BKK_FS0523	10-Jul-24	10-Jan-25	6
Stack	Chlorine	Flue gas Analyzer	RYG_FS0711	16-Jul-24	16-Jul-25	12
Stack	Chlorine	Flue gas Analyzer	RYG_FS0564	24-Apr-24	23-Apr-25	12
Stack	Chlorine	Ion Chromatography	BKK_EN0069	12-Jan-24	12-Jan-25	12
Stack	Hydrogen Chloride	Console Control Unit	BKK_FS0556	10-Jul-24	10-Jan-25	6
Stack	Hydrogen Chloride	Console Control Unit	BKK_FS0518	10-Jul-24	10-Jan-25	6
Stack	Hydrogen Chloride	Pitot Tube	BKK_FS0560	10-Jul-24	10-Jan-25	6
Stack	Hydrogen Chloride	Pitot Tube	BKK_FS0523	10-Jul-24	10-Jan-25	6
Stack	Hydrogen Chloride	Flue gas Analyzer	RYG_FS0711	16-Jul-24	16-Jul-25	12
Stack	Hydrogen Chloride	Flue gas Analyzer	RYG_FS0564	24-Apr-24	23-Apr-25	12
Stack	Hydrogen Chloride	Ion Chromatography	BKK_EN0069	12-Jan-24	12-Jan-25	12
Stack	Oxides of Nitrogen	Console Control Unit	BKK_FS0556	10-Jul-24	10-Jan-25	6
Stack	Oxides of Nitrogen	Console Control Unit	BKK_FS0518	10-Jul-24	10-Jan-25	6
Stack	Oxides of Nitrogen	Dry Gas	BKK_FS0465	10-Jul-24	10-Jan-25	6
Stack	Oxides of Nitrogen	Pitot Tube	BKK_FS0560	10-Jul-24	10-Jan-25	6
Stack	Oxides of Nitrogen	Pitot Tube	BKK_FS0523	10-Jul-24	10-Jan-25	6
Stack	Oxides of Nitrogen	Pitot Tube	BKK_FS0561	10-Jul-24	10-Jan-25	6
Stack	Oxides of Nitrogen	Pitot Tube	BKK_FS0473	10-Jul-24	10-Jan-25	6
Stack	Oxides of Nitrogen	Flue gas Analyzer	RYG_FS0711	16-Jul-24	16-Jul-25	12
Stack	Oxides of Nitrogen	Flue gas Analyzer	RYG_FS0564	24-Apr-24	23-Apr-25	12
Stack	Oxides of Nitrogen	Flue gas Analyzer	RYG_FS0563	26-Jan-24	25-Jan-25	12
Stack	Oxides of Nitrogen	Vacuum Gauge	BKK_FS0483	20-Aug-24	20-Feb-26	18
Stack	Oxides of Nitrogen	Vacuum Gauge	RYG_FS0333	3-Oct-24	2-Apr-26	18
Stack	Oxides of Nitrogen	Vacuum Gauge	RYG_FS0332	3-Oct-24	2-Apr-26	18
Stack	Oxides of Nitrogen	SPECTROPHOTOMETER	RYG_EN0179	18-Sep-23	18-Mar-25	18
Stack	Ethylene Dichloride	Console Control Unit	BKK_FS0556	10-Jul-24	10-Jan-25	6
Stack	Ethylene Dichloride	Console Control Unit	BKK_FS0518	10-Jul-24	10-Jan-25	6
Stack	Ethylene Dichloride	Pitot Tube	BKK_FS0560	10-Jul-24	10-Jan-25	6
Stack	Ethylene Dichloride	Pitot Tube	BKK_FS0523	10-Jul-24	10-Jan-25	6
Stack	Ethylene Dichloride	Flue gas Analyzer	RYG_FS0711	16-Jul-24	16-Jul-25	12
Stack	Ethylene Dichloride	Flue gas Analyzer	RYG_FS0564	24-Apr-24	23-Apr-25	12
Stack	Ethylene Dichloride	DRYCAL FLOWMETER	BKK_FS1346	29-Jan-24	28-Jan-25	12
Stack	Ethylene Dichloride	GC-MSD	BKK_EN0410	10-May-24	10-Nov-25	18



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Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Stack	Vinyl chloride	Console Control Unit	BKK_FS0556	10-Jul-24	10-Jan-25	6
Stack	Vinyl chloride	Console Control Unit	BKK_FS0518	10-Jul-24	10-Jan-25	6
Stack	Vinyl chloride	Pitot Tube	BKK_FS0560	10-Jul-24	10-Jan-25	6
Stack	Vinyl chloride	Pitot Tube	BKK_FS0523	10-Jul-24	10-Jan-25	6
Stack	Vinyl chloride	Flue gas Analyzer	RYG_FS0711	16-Jul-24	16-Jul-25	12
Stack	Vinyl chloride	Flue gas Analyzer	RYG_FS0564	24-Apr-24	23-Apr-25	12
Stack	Vinyl chloride	DRYCAL FLOWMETER	BKK_FS1346	29-Jan-24	28-Jan-25	12
Stack	Vinyl chloride	GC-MSD	BKK_EN0410	10-May-24	10-Nov-25	18
Stack	Dioxin and Furan	Console Control Unit	RYG_FS0315	10-Jul-24	10-Jan-25	6
Stack	Dioxin and Furan	Pitot Tube	RYG_FS0321	10-Jul-24	10-Jan-25	6
Stack	Dioxin and Furan	Pitot Tube	RYG_FS0320	10-Jul-24	10-Jan-25	6
Stack	Dioxin and Furan	Flue gas Analyzer	RYG_FS0563	26-Jan-24	25-Jan-25	12
Stack	Dioxin and Furan	HRGC/MS	No. 73/2022	14-Feb-22	14-Feb-27	60
Stack (CEMs)	Oxides of Nitrogen	Analyzer , System calibration, Star	-	-	-	-
Stack (CEMs)	Oxygen	Analyzer , System calibration, Star	-	-	-	-
Workplace	Chlorine	Field Rotameter	RYG_FS0197	1-Jul-24	1-Oct-24	3
Workplace	Chlorine	DRYCAL FLOWMETER	BKK_FS1346	29-Jan-24	28-Jan-25	12
Workplace	Hydrogen Chloride	Field Rotameter	RYG_FS0655	2-Jul-24	2-Oct-24	3
Workplace	Hydrogen Chloride	DRYCAL FLOWMETER	BKK_FS1346	29-Jan-24	28-Jan-25	12
Workplace	Hydrogen Chloride	Ion Chromatography	BKK_EN0069	12-Jan-24	12-Jan-25	12
Workplace	Ethylene Dichloride	Field Rotameter	RYG_FS0199	2-Jul-24	2-Oct-24	3
Workplace	Ethylene Dichloride	DRYCAL FLOWMETER	BKK_FS1346	29-Jan-24	28-Jan-25	12
Workplace	Ethylene Dichloride	GC-MSD	BKK_EN0410	10-May-24	10-Nov-25	18
Workplace	Vinyl Chloride	Field Rotameter	RYG_FS0199	2-Jul-24	2-Oct-24	3
Workplace	Vinyl Chloride	DRYCAL FLOWMETER	BKK_FS1346	29-Jan-24	28-Jan-25	12
Workplace	Vinyl Chloride	GC-MSD	BKK_EN0410	10-May-24	10-Nov-25	18
Noise	Leq 24 hrs	Sound Calibrator	RYG_FS0213	28-Feb-24	27-Feb-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0493	23-Feb-24	22-Feb-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0613	5-Jan-24	4-Jan-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0614	5-Jan-24	4-Jan-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0617	12-Jan-24	11-Jan-25	12
Noise	Leq 8 hrs & Octave Band	Sound Calibrator	RYG_FS0213	28-Feb-24	27-Feb-25	12
Noise	Leq 8 hrs & Octave Band	Sound Level Meter	RYG_FS0300	1-Sep-23	1-Sep-24	12
Noise	Leq 8 hrs & Octave Band	Sound Level Meter	RYG_FS0303	10-Aug-23	10-Aug-24	12
Noise	Leq 8 hrs & Octave Band	Sound Level Meter	RYG_FS0304	1-Sep-23	1-Sep-24	12
Noise	Leq 8 hrs & Octave Band	Sound Level Meter	RYG_FS0381	19-Oct-23	19-Oct-24	12
Noise	Leq 8 hrs & Octave Band	Sound Level Meter	RYG_FS0384	19-Oct-23	19-Oct-24	12
Noise	Leq 8 hrs & Octave Band	Sound Level Meter	RYG_FS0386	19-Oct-23	19-Oct-24	12
Noise	Leq 8 hrs & Octave Band	Sound Level Meter	RYG_FS0388	5-Jan-24	4-Jan-25	12
Noise	Leq 8 hrs & Octave Band	Sound Level Meter	RYG_FS0389	5-Jan-24	4-Jan-25	12
Noise	Leq 8 hrs & Octave Band	Sound Calibrator	RYG_FS0496	26-Jan-24	25-Jan-25	12
Noise	Leq 8 hrs & Octave Band	Sound Level Meter	NKH_FS0129	9-Jul-24	9-Jul-25	12
Noise	Leq 8 hrs & Octave Band	Sound Level Meter	NKH_FS0131	9-Jul-24	9-Jul-25	12
Noise	Leq 8 hrs & Octave Band	Sound Level Meter	NKH_FS0133	9-Jul-24	9-Jul-25	12
Noise	Leq 8 hrs & Octave Band	Sound Level Meter	NKH_FS0135	9-Jul-24	9-Jul-25	12
Noise	Noise Dose, TWA	Dose Badge Reader	RYG_FS0210	29-Jan-24	28-Jan-25	12
Noise	Noise Dose, TWA	Dose Badge Reader	RYG_FS0212	4-Sep-24	4-Sep-25	12
Illuminance	Illuminance	Lux Meter	RYG_FS0471	14-Mar-24	13-Mar-25	12
Illuminance	Illuminance	Lux Meter	RYG_FS0536	28-Nov-23	27-Nov-24	12
Illuminance	Illuminance	Lux Meter	RYG_FS0538	10-Sep-23	10-Sep-25	12
Rayong Lab	pH at 25 °C	pH Meter	RYG_EN0152	14-Dec-23	14-Jun-25	18
Rayong Lab	SV30	Chamber (Cooling Room)	RYG_EN0184	11-Jun-24	11-Dec-25	18
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	Total Suspended Solids	Electronic Balance	RYG_EN0002	22-Feb-24	22-Feb-25	12
Rayong Lab	Total Suspended Solids	Hot Air Oven	RYG_EN0010	21-Mar-24	21-Sep-25	18
Rayong Lab	Total Dissolved Solids 180°C	Electronic Balance	RYG_EN0002	22-Feb-24	22-Feb-25	12
Rayong Lab	Total Dissolved Solids 180°C	Hot Air Oven	RYG_EN0010	21-Mar-24	21-Sep-25	18



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Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
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	Temperature	Digital Thermometer With Sensor	RYG_F50392	18-Jan-24	18-Jan-25	12
Water Lab	Ethylene Dichloride	Gas Chromatography (MSD)	BKK_EN0059	13-Dec-23	13-Jun-25	18
Water Lab	Vinyl Chloride	Gas Chromatography (MSD)	BKK_EN0059	13-Dec-23	13-Jun-25	18
Water Lab	Mixed Liquor Volatile Suspended Solids	Electronic Top-Loading Balance	BKK_EN0003	2-Aug-24	2-Aug-25	12
Water Lab	Mixed Liquor Volatile Suspended Solids	Oven	BKK_EN0273	14-May-24	14-Nov-25	18
Water Lab	Mixed Liquor Volatile Suspended Solids	Furnace	BKK_FLO019	4-Jul-23	4-Jan-25	18
Soil gas	Total VOCs	TVOC Analyzer	BKK_F50821	25-Aug-23	25-Feb-25	18

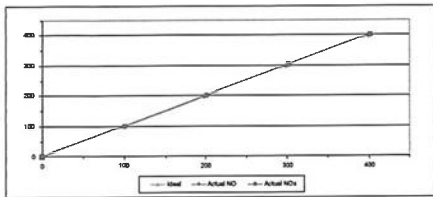


MULTIPOINT CALIBRATION REPORT

Calibration Date: 2-Jul-24
Manufacturer: HORIBA
Serial No.: SEEAWSSE
Calibrator Manufacturer: Teflon API
Serial No.: 947
Std. Gas Concentration (PPM): 86.88
Cylinder Pressure (psi): 1800
Certified Date: 5-Feb-22

Equipment Name: NOx Analyzer
Model: APMA-370
Equipment ID: RYG-F30261
Model: 700
Cylinder No.: GNR027222
Certified By: Argos Inc.
Expired Date: 5-Feb-30

Point	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	100.30	0.30	0.30
2	200.00	197.70	-2.30	-1.15	201.30	1.30	0.65
3	300.00	298.10	-1.90	-0.63	302.30	2.30	0.77
4	400.00	398.60	-1.40	-0.35	401.40	1.40	0.35
AVERAGE (%)				-0.67			0.38



Calibrated By

Approved By

(Mr. Jirawat Sakum)
Field Environmental Scientist (T)

(Mr. Jirawat Sakum)
Assistant General Manager

ALS Laboratory Group
FORM NO. F-56-058 REVISION NO. 1 ISSUE DATE: 05/04/12

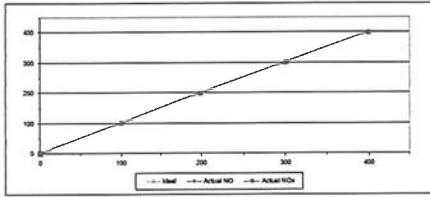


MULTIPOINT CALIBRATION REPORT

Calibration Date: 2-Jul-24
Manufacturer: HORIBA
Serial No.: TAY8864
Calibrator Manufacturer: Teflon API
Serial No.: 947
Std. Gas Concentration (PPM): 86.88
Cylinder Pressure (psi): 1800
Certified Date: 5-Feb-22

Equipment Name: NOx Analyzer
Model: APMA-370
Equipment ID: RYG-F30272
Model: 700
Cylinder No.: GNR027222
Certified By: Argos Inc.
Expired Date: 5-Feb-30

Point	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.06	0.06	0.06	0.10	0.10	0.10
1	100.00	99.10	-0.90	-0.90	100.10	0.10	0.10
2	200.00	198.60	-1.40	-0.70	199.20	-0.80	-0.40
3	300.00	298.60	-1.40	-0.47	300.60	0.60	0.17
4	400.00	398.10	-1.90	-0.47	398.70	-1.30	-0.33
AVERAGE (%)				-0.61			-0.07



Calibrated By

Approved By

(Mr. Jirawat Sakum)
Field Environmental Scientist (T)

(Mr. Jirawat Sakum)
Assistant General Manager

ALS Laboratory Group
FORM NO. F-56-058 REVISION NO. 1 ISSUE DATE: 05/04/12

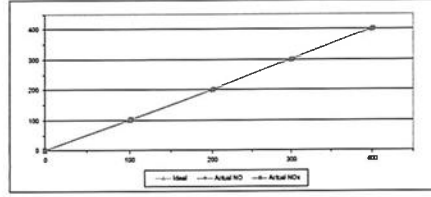


MULTIPOINT CALIBRATION REPORT

Calibration Date: 2-Jul-24
Manufacturer: HORIBA
Serial No.: SEEAWSSE
Calibrator Manufacturer: Teflon API
Serial No.: 947
Std. Gas Concentration (PPM): 86.88
Cylinder Pressure (psi): 1800
Certified Date: 5-Feb-22

Equipment Name: NOx Analyzer
Model: APMA-370
Equipment ID: RYG-F30261
Model: 700
Cylinder No.: GNR027222
Certified By: Argos Inc.
Expired Date: 5-Feb-30

Point	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	99.00	-1.00	-1.00	101.30	1.30	1.30
2	200.00	198.60	-1.40	-0.70	201.30	1.30	0.65
3	300.00	298.60	-1.40	-0.47	301.30	1.30	0.43
4	400.00	398.60	-1.40	-0.35	401.30	1.30	0.33
AVERAGE (%)				-0.62			0.66



Calibrated By

Approved By

(Mr. Jirawat Sakum)
Field Environmental Scientist (T)

(Mr. Jirawat Sakum)
Assistant General Manager

ALS Laboratory Group
FORM NO. F-56-058 REVISION NO. 1 ISSUE DATE: 05/04/12

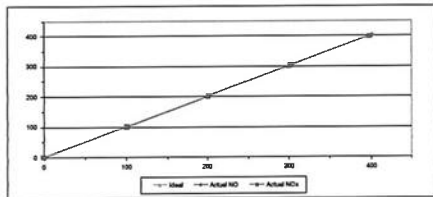


MULTIPOINT CALIBRATION REPORT

Calibration Date: 2-Jul-24
Manufacturer: HORIBA
Serial No.: 148ED80
Calibrator Manufacturer: Teflon API
Serial No.: 947
Std. Gas Concentration (PPM): 86.88
Cylinder Pressure (psi): 1800
Certified Date: 5-Feb-22

Equipment Name: NOx Analyzer
Model: APMA-370
Equipment ID: RYC-F31064
Model: 700
Cylinder No.: GNR027222
Certified By: Argos Inc.
Expired Date: 5-Feb-30

Point	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	99.10	-0.90	-0.90	100.70	0.70	0.70
2	200.00	199.30	-0.70	-0.35	201.40	1.40	0.70
3	300.00	298.60	-1.40	-0.47	302.30	2.30	0.77
4	400.00	397.40	-1.60	-0.40	398.30	-1.70	-0.42
AVERAGE (%)				-0.26			0.37



Calibrated By

Approved By

(Mr. Jirawat Sakum)
Field Environmental Scientist (T)

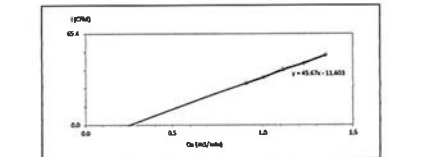
(Mr. Jirawat Sakum)
Assistant General Manager

ALS Laboratory Group
FORM NO. F-56-058 REVISION NO. 1 ISSUE DATE: 05/04/12

High Volume Air Sampler Calibration Worksheet

Project Site:	Thai Plastic & Chemical Public Co., Ltd.	Barometric Pressure (mm Hg):	757.8
Calibrator Location:	Thailand	Temperature (°C):	31.2
Calibrator Date:	6-Nov-24	High Volume ID:	RYG-F30278
Calibrator Model:	C-641124-RYG-F30278	High Volume Model:	RYG-S009E
Calibrator ID:	RYG-F30278	High Volume S/N:	5884
Calibrator Model:	TE-S0284	Calibrator Slope:	0.9581
Calibrator S/N:	1166	Calibrator Intercept:	-0.02366

Test No.	Delta H ₂ O (mmHg)	Q _h (m³/min)	F ₁ (CFM) (CFM)	Linear Regression
1	1.8	0.912	39	Slope: 0.6097
2	2.2	1.094	34	Intercept: -1.14026
3	2.7	1.112	40	Correlation Coefficient: 0.9982
4	3.2	1.227	44	
5	4.0	1.349	50	



Calibrated By

Approved By

(Mr. Jirawat Sakum)
RYG-Field Service Scientist (T)

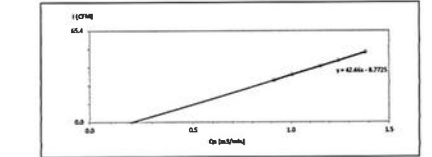
(Mr. Jirawat Sakum)
RYG-Field Service Scientist (T)

FORM NO. F-56-074 REVISION NO. 2 ISSUE DATE: 20/11/13

High Volume Air Sampler Calibration Worksheet

Project Site:	Thai Plastic & Chemical Public Co., Ltd.	Barometric Pressure (mm Hg):	757.8
Calibrator Location:	Thailand	Temperature (°C):	31.2
Calibrator Date:	6-Nov-24	High Volume ID:	RYG-F30278
Calibrator Model:	C-641124-RYG-F30278	High Volume Model:	RYG-S009E
Calibrator ID:	RYG-F30278	High Volume S/N:	5884
Calibrator Model:	TE-S0284	Calibrator Slope:	0.9581
Calibrator S/N:	1166	Calibrator Intercept:	-0.02366

Test No.	Delta H ₂ O (mmHg)	Q _h (m³/min)	F ₁ (CFM) (CFM)	Linear Regression
1	1.8	0.912	39	Slope: 0.6097
2	2.2	1.094	34	Intercept: -1.14026
3	2.7	1.112	40	Correlation Coefficient: 0.9982
4	3.2	1.227	44	
5	4.0	1.349	50	



Calibrated By

Approved By

(Mr. Jirawat Sakum)
RYG-Field Service Scientist (T)

(Mr. Jirawat Sakum)
RYG-Field Service Scientist (T)

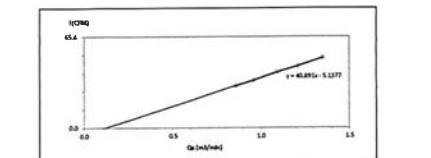
FORM NO. F-56-074 REVISION NO. 2 ISSUE DATE: 20/11/13



High Volume Air Sampler Calibration Worksheet

Project Site:	Thai Plastic & Chemical Public Co., Ltd.	Barometric Pressure (mm Hg):	757.8
Calibrator Location:	Thailand	Temperature (°C):	31.2
Calibrator Date:	6-Nov-24	High Volume ID:	RYG-F30278
Calibrator Model:	C-641124-RYG-F30278	High Volume Model:	RYG-S009E
Calibrator ID:	RYG-F30278	High Volume S/N:	5884
Calibrator Model:	TE-S0284	Calibrator Slope:	0.9581
Calibrator S/N:	1166	Calibrator Intercept:	-0.02366

Test No.	Delta H ₂ O (mmHg)	Q _h (m³/min)	F ₁ (CFM) (CFM)	Linear Regression
1	1.8	0.912	39	Slope: 0.6097
2	2.2	1.094	34	Intercept: -1.14026
3	2.7	1.112	40	Correlation Coefficient: 0.9982
4	3.2	1.227	44	
5	4.0	1.349	50	



Calibrated By

Approved By

(Mr. Jirawat Sakum)
RYG-Field Service Scientist (T)

(Mr. Jirawat Sakum)
RYG-Field Service Scientist (T)

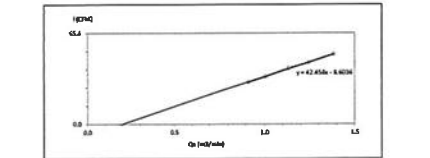
FORM NO. F-56-074 REVISION NO. 2 ISSUE DATE: 20/11/13



High Volume Air Sampler Calibration Worksheet

Project Site:	Thai Plastic & Chemical Public Co., Ltd.	Barometric Pressure (mm Hg):	757.8
Calibrator Location:	Thailand	Temperature (°C):	31.2
Calibrator Date:	6-Nov-24	High Volume ID:	RYG-F30278
Calibrator Model:	C-641124-RYG-F30278	High Volume Model:	RYG-S009E
Calibrator ID:	RYG-F30278	High Volume S/N:	5884
Calibrator Model:	TE-S0284	Calibrator Slope:	0.9581
Calibrator S/N:	1166	Calibrator Intercept:	-0.02366

Test No.	Delta H ₂ O (mmHg)	Q _h (m³/min)	F ₁ (CFM) (CFM)	Linear Regression
1	1.8	0.912	39	Slope: 0.6097
2	2.2	1.094	34	Intercept: -1.14026
3	2.7	1.112	40	Correlation Coefficient: 0.9982
4	3.2	1.227	44	
5	4.0	1.349	50	



Calibrated By

Approved By

(Mr. Jirawat Sakum)
RYG-Field Service Scientist (T)

(Mr. Jirawat Sakum)
RYG-Field Service Scientist (T)

FORM NO. F-56-074 REVISION NO. 2 ISSUE DATE: 20/11/13

Sartorius (Thailand) Co., Ltd.

101 Sukhvit Road, Bangkok, Thailand 10110
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Certificate of Calibration

Model Number: LA1202-F
Description: Analytical Balance
Serial Number: 2560884
ID No.: RYG-EN0001
Manufacturer: Sartorius
Page No.: 2 of 2

Certificate No.: 24BC0099
Issued Date: Friday, February 23, 2024
Reference No.: 229158

Calibration Results : Without Adjustment

Repeatability					Eccentricity (Off-center loading error)				
The repeatability is the ability of a weighing instrument to display nearly identical results when similar test portions are weighed under identical conditions. The repeatability is expressed as the standard deviation of the results.					The off-center loading error is the difference between the results of the load, e.g. 10 g, of material correctly placed in the center of the weighing pan and the results of the load, e.g. 10 g, of material placed at a distance from the center of the weighing pan.				
Nominal Value (Low Load)	10.0000	99.9999	10.0000	100.0000	Nominal Value	50	0	50	0
10 g	10.0000	99.9999	10.0000	100.0000	Tolerance	0.0004	0	0.0004	0
0.0001 g	10.0000	99.9999	10.0000	100.0000	Difference				
	10.0000	99.9999	10.0000	100.0000	1	0	0	0	0
	10.0000	99.9999	10.0000	100.0000	2	0	0	0	0
	10.0000	99.9999	10.0000	100.0000	3	0	0	0	0
	10.0000	99.9999	10.0000	100.0000	4	0	0	0	0
	10.0000	99.9999	10.0000	100.0000	5	0	0	0	0
	10.0000	99.9999	10.0000	100.0000	6	0	0	0	0
Standard Deviation	0.00005	0.00005	0.00005	0.00005					

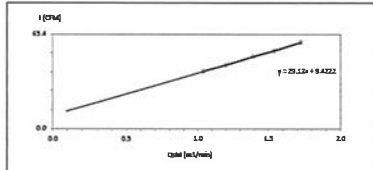
Linearity				
The linearity is the ability of a weighing instrument to display the same results for the same mass when the mass is placed at different positions on the weighing pan.				
Tolerance	0.0002 g			
Nominal Value	Conventional Mass Value	Displayed Value	Deviation	Uncertainty
0.01	0.01000	0.01000	0.00000	0.00002
0.1	0.10000	0.10000	0.00000	0.00002
1	1.00000	1.00000	0.00000	0.00002
10	10.00000	10.00000	0.00000	0.00002
100	100.00000	100.00000	0.00000	0.00002
1000	1000.00000	1000.00000	0.00000	0.00002
10000	10000.00000	10000.00000	0.00000	0.00002
100000	100000.00000	100000.00000	0.00000	0.00002
1000000	1000000.00000	1000000.00000	0.00000	0.00002

SOP FM 31-03 February 2022

High Volume Air Sampler Calibration Worksheet

Project Site: Thai Plastic & Chemical Public Co., Ltd.
Calibrate Location: 4-Nm-24
Calibrate Date: 6-Nov-24
Calibration Sheet No.: C-041124-RYG-FS0163
Calibrator ID: RYG-FS0163
Calibrator Model: TE 5078A
Calibrator S/N: 1166
Barometric Pressure (mm Hg): 757.6
Temperature (°C): 31.2
High Volume ID: RYG-FS0163
High Volume Model: TE 5078A
High Volume S/N: 4260
Calibrator Slope: 1.52567
Calibrator Intercept: -0.95613

Test No.	Delta H ₂ O (mL)	Q _{air} (m³/min)	Chart (CFM)	Linear Regression
1	2.4	1.0977	40	Slope: 29.1295
2	3.2	1.1949	44	Intercept: 9.4222
3	4.4	1.3949	50	Correlation Coefficient: 0.9993
4	5.4	1.5415	54	
5	6.8	1.7254	60	



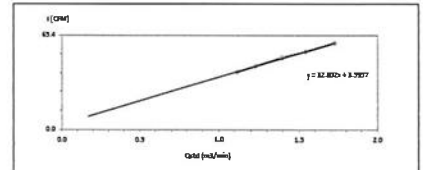
Calibrated by: Nigat
Approved by: Spt S
(Mr. Nontakul Uppakorn)
RYG-Field Services Section Head

FORM NO. F-04-073 REVISION NO. 2 ISSUE DATE: 20/11/23

High Volume Air Sampler Calibration Worksheet

Project Site: Thai Plastic & Chemical Public Co., Ltd.
Calibrate Location: 4-Nm-24
Calibrate Date: 6-Nov-24
Calibration Sheet No.: C-041124-RYG-FS0164
Calibrator ID: RYG-FS0164
Calibrator Model: TE 5078A
Calibrator S/N: 1166
Barometric Pressure (mm Hg): 757.6
Temperature (°C): 31.2
High Volume ID: RYG-FS0164
High Volume Model: TE 5078A
High Volume S/N: 4260
Calibrator Slope: 1.52567
Calibrator Intercept: -0.95613

Test No.	Delta H ₂ O (mL)	Q _{air} (m³/min)	Chart (CFM)	Linear Regression
1	2.4	1.1201	40	Slope: 3.40518
2	3.4	1.2306	44	Intercept: 3.1477
3	4.4	1.3949	50	Correlation Coefficient: 0.9992
4	5.4	1.5415	54	
5	6.8	1.7254	60	



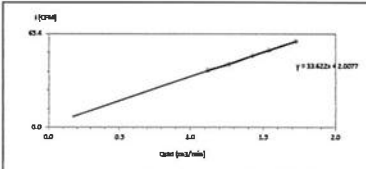
Calibrated by: Nigat
Approved by: Spt S
(Mr. Nontakul Uppakorn)
RYG-Field Services Section Head

FORM NO. F-04-073 REVISION NO. 2 ISSUE DATE: 20/11/23

High Volume Air Sampler Calibration Worksheet

Project Site: Thai Plastic & Chemical Public Co., Ltd.
Calibrate Location: 4-Nm-24
Calibrate Date: 6-Nov-24
Calibration Sheet No.: C-041124-RYG-FS0165
Calibrator ID: RYG-FS0165
Calibrator Model: TE 5078A
Calibrator S/N: 1166
Barometric Pressure (mm Hg): 757.6
Temperature (°C): 31.2
High Volume ID: RYG-FS0165
High Volume Model: TE 5078A
High Volume S/N: 4260
Calibrator Slope: 1.52567
Calibrator Intercept: -0.95613

Test No.	Delta H ₂ O (mL)	Q _{air} (m³/min)	Chart (CFM)	Linear Regression
1	2.4	1.1201	40	Slope: 33.8226
2	3.4	1.2306	44	Intercept: 2.0077
3	4.4	1.4255	50	Correlation Coefficient: 0.9991
4	5.4	1.5415	54	
5	6.8	1.7254	60	



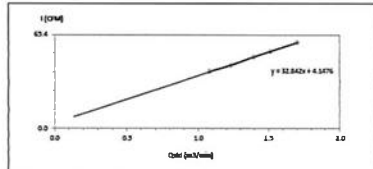
Calibrated by: Nigat
Approved by: Spt S
(Mr. Nontakul Uppakorn)
RYG-Field Services Section Head

FORM NO. F-04-073 REVISION NO. 2 ISSUE DATE: 20/11/23

High Volume Air Sampler Calibration Worksheet

Project Site: Thai Plastic & Chemical Public Co., Ltd.
Calibrate Location: 4-Nm-24
Calibrate Date: 6-Nov-24
Calibration Sheet No.: C-041124-RYG-FS0176
Calibrator ID: RYG-FS0176
Calibrator Model: TE 5078A
Calibrator S/N: 1166
Barometric Pressure (mm Hg): 757.6
Temperature (°C): 31.2
High Volume ID: RYG-FS0176
High Volume Model: TE 5078A
High Volume S/N: 4260
Calibrator Slope: 1.52567
Calibrator Intercept: -0.95613

Test No.	Delta H ₂ O (mL)	Q _{air} (m³/min)	Chart (CFM)	Linear Regression
1	2.4	1.0907	40	Slope: 32.8419
2	3.4	1.2306	44	Intercept: 4.3476
3	4.4	1.3949	50	Correlation Coefficient: 0.9991
4	5.2	1.5133	54	
5	6.8	1.7003	60	



Calibrated by: Nigat
Approved by: Spt S
(Mr. Nontakul Uppakorn)
RYG-Field Services Section Head

FORM NO. F-04-073 REVISION NO. 2 ISSUE DATE: 20/11/23



ROTA METER CALIBRATION RESULT OCTOBER 2024

Rotameter ID	Calibration Date	Regression Result	Coefficient (R²)
BKX-FS0573	02 Oct 24	Y = 0.0140x + 4.4300	1.0000
BKX-FS0577	02 Oct 24	Y = 1.1007x + 3.8082	0.9994
BKX-FS0584	02 Oct 24	Y = 0.0163x + 3.55	0.9997
BKX-FS0585	02 Oct 24	Y = 1.0324x + 2.63	0.9997
BKX-FS0587	02 Oct 24	Y = 1.020x + 1.25	0.9999
BKX-FS0591	02 Oct 24	Y = 0.0002x + 15.177	1.0000
BKX-FS0592	02 Oct 24	Y = 0.0002x + 15.500	1.0000
BKX-FS0594	02 Oct 24	Y = 1.0024x + 7.2014	1.0000
BKX-FS1008	02 Oct 24	Y = 1.0705x + 3.1952	1.0000
BKX-FS1007	02 Oct 24	Y = 1.0003x + 4.1033	0.9998
BKX-FS1008	02 Oct 24	Y = 1.1231x + 0.0792	0.9998
BKX-FS1017	02 Oct 24	Y = 1.0381x + 2.7064	0.9998
BKX-FS1018	02 Oct 24	Y = 0.0137x + 0.0333	1.0000
BKX-FS1019	02 Oct 24	Y = 1.0010x + 0.9648	1.0000
BKX-FS1026	02 Oct 24	Y = 1.1424x + 0.8571	0.9975
BKX-FS1027	02 Oct 24	Y = 1.0203x + 3.5233	1.0000
BKX-FS1028	02 Oct 24	Y = 1.0020x + 0.9067	1.0000
BKX-FS1030	02 Oct 24	Y = 1.0041x + 0.1033	0.9993
BKX-FS1040	02 Oct 24	Y = 1.0025x + 1.1010	1.0000
BKX-FS1041	02 Oct 24	Y = 1.0025x + 1.0626	1.0000
BKX-FS1042	02 Oct 24	Y = 1.0015x + 11.25	0.9995
BKX-FS1044	02 Oct 24	Y = 1.1165x + 0.7303	0.9973
PHK-FS0027	02 Oct 24	Y = 1.0940x + 3.3133	0.9991
PHK-FS0028	02 Oct 24	Y = 1.0257x + 1.5697	0.9999
PHK-FS0029	02 Oct 24	Y = 0.9990x + 14.709	1.0000
RYG-FS0105	02 Oct 24	Y = 1.0031x + 0.0204	1.0000
RYG-FS0106	02 Oct 24	Y = 1.0047x + 0.6114	1.0000
RYG-FS0107	02 Oct 24	Y = 1.0040x + 0.0704	1.0000
RYG-FS0108	02 Oct 24	Y = 1.0051x + 3.3083	1.0000
RYG-FS0109	02 Oct 24	Y = 1.0349x + 2.3083	0.9993
RYG-FS0027	02 Oct 24	Y = 1.0162x + 0.0033	0.9999
RYG-FS0028	02 Oct 24	Y = 1.0035x + 7.8087	0.9999
RYG-FS0054	02 Oct 24	Y = 1.0041x + 2.2446	0.9999
RYG-FS0055	02 Oct 24	Y = 0.9734x + 17.51	0.9997
RYG-FS0056	02 Oct 24	Y = 1.0034x + 8.991	0.9999
RYG-FS0057	02 Oct 24	Y = 1.0023x + 4.2003	0.9999
RYG-FS0058	02 Oct 24	Y = 0.9940x + 10.98	0.9998
RYG-FS0059	02 Oct 24	Y = 1.0020x + 9.2078	1.0000
SGK-FS0135	02 Oct 24	Y = 1.0020x + 3.7733	0.9999

Page 1 of 2

ALS Laboratory Group



ROTA METER CALIBRATION RESULT OCTOBER 2024

Rotameter ID	Calibration Date	Regression Result	Coefficient (R²)
SGK-FS0136	02 Oct 24	Y = 1.0313x + 1.0623	0.9999
SGK-FS0138	02 Oct 24	Y = 1.0472x + 5.6214	1.0000
SGK-FS0139	02 Oct 24	Y = 1.0105x + 4.6367	0.9998
SGK-FS0140	02 Oct 24	Y = 1.0005x + 14.979	1.0000
SGK-FS0141	02 Oct 24	Y = 1.0340x + 3.8309	1.0000
SGK-FS0142	02 Oct 24	Y = 1.0211x + 2.0233	1.0000
SGK-FS0143	02 Oct 24	Y = 1.0042x + 6.481	1.0000

Review By: Nigat
(Mr. Wichan Ooncharat)
Envo Field Services Manager

Approved By: Spt S
(Mr. Sarayuth Jitman)
Assistant General Manager

Certificate of Calibration

ICS-2100: Anion (ID#659)

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

ICS-2100 S/N: 15010977

AS-HV S/N: 5450A36559

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

Operator Signature: Nigat
(Mr. Nuidan Laekwan)
Application Chemist

Date: Jan 12, 2024



Certificate of Calibration

ICS-2100: Anion (ID#659)

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

ICS-2100 S/N: 15010977

AS-HV S/N: 5450A36559

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

Operator Signature: Nigat
(Mr. Nuidan Laekwan)
Application Chemist

Date: Jan 12, 2024



CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM

ANALYST

DATE

TIME

LOCATION

REMARKS

RECEIVED DATE

MEASUREMENT UNIT

UNIT

ENVIRONMENTAL CONDITIONS

TEMPERATURE

RELATIVE HUMIDITY

ATMOSPHERIC PRESSURE

PLANT OF CALIBRATION

LOCATION

DATE

TIME

LOCATION

REMARKS

RECEIVED DATE

MEASUREMENT UNIT

UNIT

ENVIRONMENTAL CONDITIONS

TEMPERATURE

RELATIVE HUMIDITY

ATMOSPHERIC PRESSURE

PLANT OF CALIBRATION

LOCATION

DATE

TIME

LOCATION

REMARKS

RECEIVED DATE

MEASUREMENT UNIT

UNIT

ENVIRONMENTAL CONDITIONS

TEMPERATURE

RELATIVE HUMIDITY

ATMOSPHERIC PRESSURE

PLANT OF CALIBRATION

LOCATION

DATE

TIME

LOCATION

CERTIFICATE OF CALIBRATION

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CERTIFICATE OF CALIBRATION

Certificate No. 13-0036-00 Page 2 of 2 Pages

¹ To convert the results in percent to Pa should be multiply by 100.

Approved Signature: 

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Leg Amp

Name:	S377B		
Sequence Index:	Pass		
Overall Log Amp Test Status			
Pass			
RFFA			
Tested Constitution I	Page:	55L	/ External SQ
Name:	S377B		
Sequence Index:	Pass		
AMPL	1/50	N/A	DRY After 10 min MINUTE
		5	mV
Agilent Recommended	== 100	and	== 100
			RFFA Voltage
			50L
			mV
Overall RFFA Test Status			
Pass			

Tested Construct(s)	Percent	SSL	External	SO
---------------------	---------	-----	----------	----

Assigned Status:	Pass
Flaw(s):	1
Assigned Status:	Pass
Flaw(s):	2
Overall Time to Test Status	
Pass	

Scouting Run

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Source:	El - Extractor			
Setup Date:	Completed			
Injection Volume in Column:	1.0	50		
Overall Sampling Run Status:	Completed			
Signal to Noise El				
Tested Combination:	Flow	SSL	External	50
Name:	18779			
Source:	El - Extractor	Filament:		1
Setup Date:	Pace			
Signal to Noise:	6113			
Agilent Recommended:	100			
Source:	El - Extractor	Filament:		2

Overall Signal to Noise ☒ Test Status
Pass

Date: January 5, 2024 10:53:24 AM
System ID: RYS_END136

Page 47/54

Electronic Signature

The signature page was created and outlined 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 Agent representative who has delivered the service understands the meaning and legal status of an electronic signature. As a trained field operator, the Agent representative has a unique password and login to access ACE and electronically sign the document. Other e-signatures can be applied to this document using a Document Content Management or other software methods defined by your own access and control requirements.

Details

Full Name of Signer:	Enkarn Puangvach
Logged On User Name:	enkarin_puangvach@ajk.ac.th
Signature Creation Date:	January 5, 2024
Reason for Signature:	Executed protocol and published this original version of document

Regulatory Disclosure

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

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Date: 21 July 5, 2024 12:53:24 AM
System ID: RYG-D70130

Page 5 / 14

Date: January 5, 2024 10:53:24 AM
System: RYG_SINCR25

Date: January 5, 2024 10:53:24 AM
System ID: RYG_ENG136

[illegible][illegible][illegible]

Date: January 8, 2024 10:53:24 AM
System ID: 09G_E401301

Page 8 / 14

Date: January 6, 2024 10:53:22 AM
System ID: RYG_END136

Date: January 5, 2024 10:53:24 AM
System ID: RYG_JEN235

[illegible][illegible][illegible]


Date: January 5, 2004 10:51:24 AM
System ID: RYU_END135

Order: January 5, 2024 10:53:26 AM
System ID: RTG_E27136

Date: January 5, 2024 12:53:24 AM
System ID: RTG_1143128

User Name: c13707_pargames				Session ID: 87102_000116	
Report Generated On: 2016-01-05 10:40:16 AM					
ALB_ID: ALB_000127_000103					
Time	Transaction ID	Activity Performed	Event Description	Operational Information	
January 5, 2016 10:20:11 AM	Auto	Established	Signal to Host 01: Signal received from 000127-000103 - Source: 01: Parameter value: Parameter 2 = 100	Deviations Data for Run Count 3	
January 5, 2016 10:21:11 AM	Auto	Event Plan	Signal to Host 01: Local condition: Entry 0001_001 - Signal: 01: Condition string: Parameter 2 = 100	None	
January 5, 2016 10:42:05 AM	Auto	Start	Signal to Host 01: Local condition: Host 0001_001 - Source: 01: Parameter value: Parameter 2 = 100	Data Host Path: 01: Parameter: 000103	
January 5, 2016 10:43:05 AM	Auto	Local Auto	Signal to Host 01: Local condition: Host 0001_001 - Source: 01: Condition string: Parameter 2 = 100	Run Count: 0	
January 5, 2016 10:45:07 AM	Auto	Clear Product	Stopline	END	
January 5, 2016 10:48:47 AM	Auto	Recycling	Shutdown	None	
January 5, 2016 10:50:07 AM	Auto	Warning	Condition	Auto Shut-down	
January 5, 2016 10:51:07 AM	Auto	Warning	Condition	Signal: 0001030001: Host 01	
January 5, 2016 10:51:17 AM	Auto	Warning	Condition	Hosts: Green - 01: Stopline	
January 5, 2016 10:55:05 AM	Auto	Warning	Warning	Hosts: Green - 01: Stopline	

Page 3 of 7



ENDOSE CONTROL UNIT CALIBRATION TEST REPORT

Calibration of Unit : 10-22-00

Make Cal Date : 04-Jun-02

Outside Control Unit Data

Calibration ID : G-00278-0001/0002

Dry Cal Meter ID : 000001

Serial No : 000001

Month No : 000001

Endorsement Procedure (mm): 74% 1

Moisture Penetration (mm): 46.3

Thermocouple (°C): 23.0

Endorsement Unit Data

Reference Dry Cal Meter ID : 0001/0002

Serial No : 000001

Endorsement Factor (1) : 0.9000

Moisture Calibration Date : 01/00/00

L/S#		Address: Dry Gas Wet Calibration				Calms Control Dry Gas Wet				Dry Gas Meter		Wet Gas Meter	
L/S#	Address	Dry Gas		Wet Gas		Dry Gas		Wet Gas		Dry Gas	Wet Gas	Error	Fault
		Pressure	Flow	Pressure	Flow	Pressure	Flow	Pressure	Flow				
01	171.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	0.0	0.0
02	172.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	0.0	0.0
03	173.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	0.0	0.0
04	174.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	0.0	0.0
05	175.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	0.0	0.0
06	176.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	0.0	0.0
07	177.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	0.0	0.0
08	178.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	0.0	0.0
09	179.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	0.0	0.0
10	180.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	0.0	0.0

1. **Notes:** All data reported in this report is for the unit. The unit is to be calibrated in accordance with the test procedure.

2. **Notes:** All data reported in this report is for the unit. The unit is to be calibrated in accordance with the test procedure.

3. **Notes:** All data reported in this report is for the unit. The unit is to be calibrated in accordance with the test procedure.

Calibrated by: John J. Jones

1-800-233-8888

END USE: End Use

Approved by: John J. Jones

1-800-233-8888

END USE: End Use

Stopwatch Calibration Test Report

Calibration Date : 10 Jul 24
Barometric Pressure (mmHg) : 749.1
Relative Humidity (%) : 46.2

Next Cal. Date : 10 Jan 25
Temperature (°C) : 23.8

Reference Stopwatch Data

Stopwatch ID No. : RYG_80540
Model : F306
Serial No. : E18061
Calibration Date : 4 Jul 24
Certificate No. : B-2607022

Console Control Meter Data
Dry Gas Meter No. : B9X_160306
Model : XC-072-C
Gross Flt. No. : 1358041

Run No.	Time Actual (seconds)	Time Reading (mins)	DtE (ms)	DtE (sec)
1	5:00:03	5:00	3	0.0005
2	5:00:07	5:00	7	0.0012
3	5:00:07	5:00	7	0.0012
4	5:00:08	5:00	8	0.0013
5	5:00:05	5:00	5	0.0008
6	5:00:07	5:00	7	0.0012
7	5:00:06	5:00	6	0.0010
8	5:00:08	5:00	8	0.0013
9	5:00:08	5:00	8	0.0013
10	5:00:07	5:00	7	0.0012
Average				0.0011
SD				0.0003

Calibrate by :

Michael Jengemroving

Mr. Robert Pichapichat

Approved by :

Nattapon Jengemroving

Mr. Nattapon Jengemroving

RYG Field Service Specialist (M)

RYG Field Service Specialist (T)

Date: January 3, 2014 12:53:24 AM
System ID: F002_EN0126

DIGITAL TEMPERATURE CALIBRATION DATA SHEET


Calibration Date :		10 Jul 24	Ambient Temperature (°C)		33.8
Calibration sheet No. :		Q-103724-000-Q10007	Relative Humidity (%)		46.2
Digital Temperature ID :		WQJ-03052	Reference Temperature ID		RT(JL)3081
Serial No. :		102641	Model No. :		2019001-4316
Model :		3D-572-V	Model :		Quanta-CG-VY-465
			Host Calibrate :		13 Nov 24

Location	Reference Temperature	Digital Temperature	Error	LMPE	Pass / Fail
	°C	°C	%		
Block	0	0	0	< 0.5	Pass
	25	24	-0.1	< 0.5	Pass
	50	49	-0.1	< 0.5	Pass
	100	99	-0.1	< 0.5	Pass
	150	149	-0.1	< 0.5	Pass
	200	199	-0.1	< 0.5	Pass
	250	249	-0.1	< 0.5	Pass
	300	299	-0.1	< 0.5	Pass
	350	349	-0.1	< 0.5	Pass
	400	399	-0.1	< 0.5	Pass
Probe	100	99	-0.1	< 0.5	Pass
	125	119	-0.1	< 0.5	Pass
	140	139	-0.1	< 0.5	Pass
	150	99	-0.1	< 0.5	Pass
	129	119	-0.1	< 0.5	Pass
Ovens	140	139	-0.1	< 0.5	Pass
	129	119	-0.1	< 0.5	Pass
	140	139	-0.1	< 0.5	Pass
	100	100	0	< 0.5	Pass
	129	120	0	< 0.5	Pass
Filter	140	141	0.1	< 0.5	Pass
	129	130	0	< 0.5	Pass
	140	141	0.1	< 0.5	Pass
	129	130	0	< 0.5	Pass
	140	141	0.1	< 0.5	Pass
Cust	0	0	0	< 0.5	Pass
	15	10	-0.5	< 0.5	Pass
	25	22	-0.3	< 0.5	Pass
	0	0	0	< 0.5	Pass
	0	0	0	< 0.5	Pass
Melter	25	25	0	< 0.5	Pass
	50	50	0	< 0.5	Pass
	0	0	0	< 0.5	Pass
	0	0	0	< 0.5	Pass
	25	24	-0.1	< 0.5	Pass
ALU	50	49	-0.1	< 0.5	Pass

LMPE : (Maximum permissible error of measurement) $\pm 0.5\%$ of reading or $\pm 0.5^\circ\text{C}$ or $\pm 0.5^\circ\text{F}$

Collected by : <div style="text-align: center;"> <u>Subodh Choudhary</u> </div>	Assessed by : <div style="text-align: center;"> <u>Nitish Jaiswal</u> </div>	Mr. Prashant Jaiswal BYD Field Service Specialist (2)
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FORM No. Q-0427 REVISION No. 2 ISSUE DATE: 9 Feb 2019



PROBE NOZZLE DIAMETER CALIBRATION DATA SHEET

Calibration Date: 19 Jul 24	Heatset Ser ID.: BHK_P30562	
Calibration Sheet No.: C-120724-BHK_P30562	Vendor Cal Date: BHK_P31123	

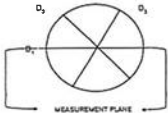
Nozzle ID #	Nozzle Diameter (mm.)			H - Ls	$(D_1 + D_2 + D_3) / 3$
	D_1	D_2	D_3	ΔD	D_{avg}
1	0.305	0.302	0.302	0.003	0.303
2	0.485	0.475	0.485	0.010	0.482
3	0.625	0.635	0.635	0.015	0.630
4	0.755	0.755	0.765	0.000	0.755
5	0.970	0.980	0.975	0.010	0.975
6	1.065	1.065	1.081	0.004	1.064
7	1.275	1.275	1.275	0.000	1.275
8	1.610	1.610	1.615	0.005	1.612

Where:

D_1, D_2, D_3 = Three different nozzle diameters at 90 degrees to each other, each measured the nearest 0.002 mm.

ΔD = Maximum distance between any two diameters, must be ≤ 0.02 mm.

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



Collected by: Sahar Bhatnagar

(US Subst Representative)

RTS Field Service Scientist (H)


Approved by: Natgun Jangra

(US National Representative)

RTS Field Service Scientist (H)

7/19/24 10:00 AM

[illegible]



Stopwatch Calibration Test Report

Calibration Date : 10 Jul 24

Barometric Pressure (mmHg) : 752.4

Relative Humidity (%) : 64.0

Next Cal. Date : 10 Jan 25

Temperature (°C) : 29.2

Reference Stopwatch Data

Stopwatch ID No. : RYG_F52540

Model : F308

Serial No. : E18D61

Calibration Date : 4 Jul 24

Certificate No. : E-3407022

Console Control Meter Data

Dry Gas Meter No. : B9XG_F5318

Model : XC-672-M

Serial No. : 1504625

Run No.	Time Actual (secs.ms)	Time Reading (secs)	Diff. (ms)	Diff. (mins)
1	5:00:03	5:00	3	0.00005
2	5:00:07	5:00	7	0.00012
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	5:00:06	5:00	6	0.00010
9	5:00:07	5:00	7	0.00012
10	5:00:07	5:00	7	0.00012
Average:				0.00010
SD				0.00002

Calibrate by : Shahid Prasad

Mr. Shahid Prasad

RYG Field Service Specialist (4)

Approved by : Nathan Jayaram

Mr. Nathan Jayaram

RYG Field Service Specialist (1)

DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date : 10 Jul 24		Ambient Temperature (°C) 29.2	
Calibration sheet No : Q-1234-900-782019		Relative Humidity (%) 64	
Digital Temperature ID BPC_730516		Reference Temperature ID RYS_730601	
Serial No. : 150425		Serial No. : 227025 14716	
Model : 3C-52-V		Model : DigiCon-CG-V7-M8	
Allow Calibration :		13 Nov 24	

Location	Reference Temperature °C	Digital Temperature °C	Error °C	LRPE	Pass / Fail
Block	0	0	0	<0.3	Pass
	25	25	0	<0.3	Pass
	125	125	0	<0.3	Pass
	150	150	0	<0.3	Pass
	175	175	0	<0.3	Pass
Probe	200	201	1	<0.3	Pass
	250	251	1	<0.3	Pass
	300	301	1	<0.3	Pass
	350	351	1	<0.3	Pass
	400	401	1	<0.3	Pass
Oven	120	120	0	<0.3	Pass
	140	141	1	<0.3	Pass
	160	160	0	<0.3	Pass
Fiber	120	121	1	<0.3	Pass
	140	141	1	<0.3	Pass
	160	160	0	<0.3	Pass
ESR	120	121	1	<0.3	Pass
	140	141	1	<0.3	Pass
	160	160	0	<0.3	Pass
Water	120	121	1	<0.3	Pass
	140	141	1	<0.3	Pass
	160	160	0	<0.3	Pass
ALX	120	121	1	<0.3	Pass
	140	141	1	<0.3	Pass
	160	160	0	<0.3	Pass

NOTE : Maximum permissible error of measurement of thermocouples against the reference

Calibrated by :

Sushant Kumar

Approved by :

Natasha Jeyapalan

Mr. Subash Kumar

Mr. Natashan Jeyapalan

RTD Field Service Schemes (4)

RTD Field Service Schemes (1)

FORM NO. F 58-02 REVISED - 2 ISSUE DATE 9 Feb 23

PROBE NOZZLE DIAMETER CALIBRATION DATA SHEET

Calibration Date: 10-Jul-24

Nozzle Set ID #: 1

BKX_F50524

Calibration Sheet No.: C-10724-BKX_F50524

Vendor Catalog ID: BKX_F51123

Nozzle ID #	Nozzle Diameter (mm)			H - Lc	D ₁ = D ₂ = D ₃ /3
	D ₁	D ₂	D ₃	Δd	D _{avg}
1	0.318	0.318	0.318	0.000	0.318
2	0.472	0.474	0.475	0.003	0.474
3	0.632	0.633	0.634	0.003	0.634
4	0.792	0.792	0.792	0.000	0.792
5	0.952	0.952	0.952	0.000	0.952
6	1.091	1.110	1.092	0.019	1.098
7	1.256	1.262	1.262	0.006	1.260
8	1.601	1.599	1.600	-0.003	1.600

(Notes :)

D₁, D₂, D₃ : If there differs nozzle diameters at 90 degrees to each other, each measured five times ±0.02 mm.

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

D_{avg} : (D₁ + D₂ + D₃) / 3

Calibrated by :

Sakari Minemura

(Lab. Sales Representative)

RTD Field Service Specialist (H)

Assessed by :

Natsumi Inagawa

(Lab. Headquarter / Japan representative)

RTD Field Service Specialist (H)

MODEL NO. ALS-1000 VER. 1.000 (2022.07.01)



Type S Pitot Tube Calibration

Date Calibration 10-Jul-24
Pitot ID BKC_F50550
Pitot SN

Date Date 10-Jan-25
Serial/Inspection ID BKC_F51131
Vendor ID RVC_F50559

Parameter	Value	allowable Range	Check
Q1	0.8	$-10^{\circ} \leq \Delta 1^{\circ} \leq 10^{\circ}$	OK
Q2	1.6	$-10^{\circ} \leq \Delta 2^{\circ} \leq 10^{\circ}$	OK
B1	-2.3	$-5^{\circ} \leq \Delta 1^{\circ} \leq 5^{\circ}$	OK
B2	-0.5	$-5^{\circ} \leq \Delta 2^{\circ} \leq 5^{\circ}$	OK
Y	-1.1	-	-
Q	1.5	-	-
Z = A tan θ	-0.017	$Z \leq 0.125^{\circ}$	OK
W = A tan θ	0.020	$W \leq 0.031^{\circ}$	OK
D1	0.311	0.188° to 0.375°	OK
A/2D1	1.415	$1.05 \leq PA/D1 \leq 1.5$	OK
A	0.85	$2.104 \leq A \leq 3.04$	OK

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

Calibrated by: *Mr. Subot Praditsamrit*
(Mr. Subot Praditsamrit)
RVC Field Services Scientist (F)

Approved by: *Mr. Nattapon Jangyong*
(Mr. Nattapon Jangyong)
RVC Field Services Specialist (F)

FORM NO. 1-FM-124 REVISION NO. 1 ISSUE DATE: 25/12/23



Type S Pitot Tube Calibration

Date Calibration 10-Jul-24
Pitot ID BKC_F50553
Pitot SN

Date Date 10-Jan-25
Serial/Inspection ID BKC_F51131
Vendor ID RVC_F50559

Parameter	Value	allowable Range	Check
Q1	0.2	$-10^{\circ} \leq \Delta 1^{\circ} \leq 10^{\circ}$	OK
Q2	2.4	$-10^{\circ} \leq \Delta 2^{\circ} \leq 10^{\circ}$	OK
B1	-1.2	$-5^{\circ} \leq \Delta 1^{\circ} \leq 5^{\circ}$	OK
B2	-0.5	$-5^{\circ} \leq \Delta 2^{\circ} \leq 5^{\circ}$	OK
Y	-1.1	-	-
Q	1.5	-	-
Z = A tan θ	-0.018	$Z \leq 0.125^{\circ}$	OK
W = A tan θ	0.001	$W \leq 0.031^{\circ}$	OK
D1	0.308	0.188° to 0.375°	OK
A/2D1	1.484	$1.05 \leq PA/D1 \leq 1.5$	OK
A	0.92	$2.104 \leq A \leq 3.04$	OK

Certify that pitot tube/pitot meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube certification fact of 0.86. See 40 CFR Pt. 60, App. A, EPA Method 2.

Calibrated by: *Mr. Subot Praditsamrit*
(Mr. Subot Praditsamrit)
RVC Field Services Scientist (F)

Approved by: *Mr. Nattapon Jangyong*
(Mr. Nattapon Jangyong)
RVC Field Services Specialist (F)

FORM NO. 1-FM-124 REVISION NO. 1 ISSUE DATE: 25/12/23

Calibration certificate Kalibrier-Zertifikat 5753561

Client: *TESTO SE & Co. KG*
Manufacturer: *TESTO SE & Co. KG*
Type description: *0632 3011*
Serial no.: *64563967*
Inventory no.: *64749408*
Vendor no.: *---*
Test equipment no.: *---*
Equipment no.: *15062485*
Location: *15061584*
Customer: *ALD Laboratory Group (Thailand) Co., Ltd.*
Customer address: *114 Phrasarakon Rd., Phrasarakon Sub-district, Bangna District, Bangkok 10700 Thailand*
Customer ID no.: *1028394*
Order no.: *124397024 / 64203056*
Date of calibration: *16.07.2024*
Date of the next recommended calibration: *16.07.2025*
Conformity statement: *Pass*

REVIEWED BY: *Mr. Nattapon Jangyong*
APPROVED BY: *Mr. Nattapon Jangyong*
NEXT CAL DATE: *16.07.2025*

The competence of the measurement was assessed according to EN ISO 17025 with a coverage probability of about 95% according to the uncertainty evaluation as per...

Tested by: *Mr. Nattapon Jangyong*
Supervisor: *Mr. Nattapon Jangyong*
Technical Director: *Mr. Nattapon Jangyong*

TESTO Industrial Services GmbH
Testo Mess- und Service GmbH
Testo Mess- und Service GmbH



Calibration certificate Kalibrier-Zertifikat 5753561

Measuring equipment: *Measuring equipment*
Reference: *Reference*
Ambient conditions: *Ambient conditions*
Measuring procedure: *Measuring procedure*

Measuring results: *Measuring results*
Channel: *Channel*

Reference value	Indicated measured value	Deviation	Allowable deviation	Measurement uncertainty	Conformity
2000	1999	-1	± 1	0.00	Pass
4000	3999	-1	± 1	0.00	Pass
6000	5999	-1	± 1	0.00	Pass
8000	7999	-1	± 1	0.00	Pass
10000	9999	-1	± 1	0.00	Pass
12000	11999	-1	± 1	0.00	Pass
14000	13999	-1	± 1	0.00	Pass
16000	15999	-1	± 1	0.00	Pass
18000	17999	-1	± 1	0.00	Pass
20000	19999	-1	± 1	0.00	Pass

Remarks: *Remarks*



Calibration Certificate

Certificate No.: *G575250*
Date of issue: *25-Apr-24*

REVIEWED BY: *Mr. Nattapon Jangyong*
APPROVED BY: *Mr. Nattapon Jangyong*
NEXT CAL DATE: *25-Apr-25*

Instrument description: *Instrument description*
Instrument model: *Instrument model*
Instrument serial no.: *Instrument serial no.*
ID no. or control no.: *ID no. or control no.*
Manufacturer: *Manufacturer*
Profile description: *Profile description*
Probe model: *Probe model*
Probe serial no.: *Probe serial no.*
Customer name: *Customer name*
Customer address: *Customer address*
Total pages of certificate: *Total pages of certificate*
Receiving date: *Receiving date*
Receiving date: *Receiving date*
Parameter of calibration: *Parameter of calibration*
Condition of use: *Condition of use*
Ambient condition: *Ambient condition*
Calibration place: *Calibration place*
Calibration procedure no.: *Calibration procedure no.*

Calibration certificate is valid for use in accordance with the calibration certificate and the results of the calibration.

Calibration certificate is valid for use in accordance with the calibration certificate and the results of the calibration.

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Calibration Certificate

Certificate No.: *G575250*

Standard References (Table 1)
Certificate No.: *Certificate No.*
Vendor: *Vendor*
Due date: *Due date*
Calibration conditions: *Calibration conditions*
Calculation Results (Table 2)
Parameter of Standard: *Parameter of Standard*
Values: *Values*
Mean of Error: *Mean of Error*
Uncertainty: *Uncertainty*

Calibration certificate is valid for use in accordance with the calibration certificate and the results of the calibration.

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Type S Pitot Tube Calibration

Date Calibration	10-Jul-24	Due Date	10-Jan-25
Pitot ID	BK_F50561	Incubator ID	BK_F51131
Pitot SN		Vernier ID	RYG_F50539

Parameter	Value	Allowable Range	Check
B1	-2.4	-10° < B1 < +10°	OK
B2	-1.2	-10° < B2 < +10°	OK
B3	-2.0	-5° < B3 < +5°	OK
B4	1.3	-5° < B4 < +5°	OK
B	0.3	-	-
D	0.2	-	-
Z = A tan θ	0.005	Z ≤ 0.125°	OK
W = A tan θ	0.003	W ≤ 0.031°	OK
OT	0.310	0.188° to 0.375°	OK
A/ZOT	1.688	1.05 ≤ PA/Dt ≤ 1.5	OK
A	0.91	2.10E < A ≤ 3.0E	OK

Certify that pitot tube/sensor 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: *Sakthi Pragasam*
(Mr. Sakthi Pragasam)
RYG Field Services Scientist (4)

Approved by: *Manoj Kumar*
(Mr. Manoj Kumar)
RYG Field Services Specialist (1)

FORM NO. F-04-04 REVISION NO. 01 ISSUE DATE: 26/02/23



Type S Pitot Tube Calibration

Date Calibration	10-Jul-24	Due Date	10-Jan-25
Pitot ID	BK_F50473	Incubator ID	BK_F51131
Pitot SN		Vernier ID	RYG_F50539

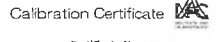
Parameter	Value	Allowable Range	Check
B1	2.5	-10° < B1 < +10°	OK
B2	1.4	-10° < B2 < +10°	OK
B3	-0.8	-5° < B3 < +5°	OK
B4	-0.4	-5° < B4 < +5°	OK
B	0.3	-	-
D	0.2	-	-
Z = A tan θ	0.005	Z ≤ 0.125°	OK
W = A tan θ	0.003	W ≤ 0.031°	OK
OT	0.310	0.188° to 0.375°	OK
A/ZOT	1.688	1.05 ≤ PA/Dt ≤ 1.5	OK
A	0.92	2.10E < A ≤ 3.0E	OK

Certify that pitot tube/sensor 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: *Sakthi Pragasam*
(Mr. Sakthi Pragasam)
RYG Field Services Scientist (4)

Approved by: *Manoj Kumar*
(Mr. Manoj Kumar)
RYG Field Services Specialist (1)

FORM NO. F-04-04 REVISION NO. 01 ISSUE DATE: 26/02/23

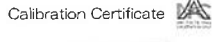


Certificate No: 0240797
Date of Issue: 26-Jan-24

Instrument description	Plus Gas 4000
Instrument model	Plus Gas 4000
Control unit serial no.	0240797 (12)
Instrument serial no.	0240797 (12)
DOE or control no.	RYG_F50539
Probe description	Plus Gas 4000
Probe model	Plus Gas 4000
Probe serial no.	0240797 (12)
Customer name	ALS LABORATORY GROUP (THAILAND) CO., LTD.
Customer address	44 Phatthanasarak Road, Phatthanasarak, Bangkok, 10130 Thailand
Total pages of certificate	21 pages
Issued on	26-Jan-24
Receiving date	26-Jan-24
Parameter of calibration	Gas Calibrator Oxygen 10.00 to 21.00 % vol, Carbon Monoxide 0.00 to 21.00 % vol, Nitrogen Dioxide 0.00 to 21.00 % vol, Nitric Oxide 0.00 to 21.00 % vol
Condition of UAC	Good
Condition of UAC	As of the measurement was carried out the calibration facility
Temperature	23.00 °C
Humidity	55 ± 10 %RH
Calibration place	10130 Phatthanasarak Road, Phatthanasarak, Bangkok, 10130
Calibration procedure no.	The instrument was calibrated by the company with Standard Gas mixture according to calibration check instruction No. 0240797

The calibration certificate is issued as evidence of the standard uncertainty of measurement. The calibration certificate is issued as evidence of the standard uncertainty of measurement. The calibration certificate is issued as evidence of the standard uncertainty of measurement.

Page 1 of 2



Certificate No: 0240797

Standard	Certificate No.	Vendor	Due date
Oxygen (O2) 10.00 % vol	0240797	Verder	27-Aug-24
Oxygen (O2) 10.00 % vol	0240797	Verder	27-Aug-24
Oxygen (O2) 10.00 % vol	0240797	Verder	27-Aug-24
Carbon Monoxide (CO) 0.00 to 21.00 % vol	0240797	Verder	27-Aug-24
Carbon Monoxide (CO) 0.00 to 21.00 % vol	0240797	Verder	27-Aug-24
Nitrogen Dioxide (NO2) 0.00 to 21.00 % vol	0240797	Verder	27-Aug-24
Nitrogen Dioxide (NO2) 0.00 to 21.00 % vol	0240797	Verder	27-Aug-24
Nitric Oxide (NO) 0.00 to 21.00 % vol	0240797	Verder	27-Aug-24
Nitric Oxide (NO) 0.00 to 21.00 % vol	0240797	Verder	27-Aug-24
Humidity (H2O) 0.00 to 21.00 % vol	0240797	Verder	27-Aug-24
Humidity (H2O) 0.00 to 21.00 % vol	0240797	Verder	27-Aug-24

Remark: 1. Standard = 1.00, 2. Standard = 1.00, 3. Standard = 1.00

End of Report



CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : VACUUM GAUGE
MANUFACTURER : DWYER
MODEL / TYPE : DPFG-40
SERIAL NO. : 21340268
CLID NO. : 21340268
JOB CONTROL NO. : 2408100797
CALIBRATION SERVICE : ☒ IN-LABORATORY ☐ ON-SITE

CUSTOMER : ALS LABORATORY GROUP (THAILAND) CO., LTD.
10130 Phatthanasarak Road, Phatthanasarak, Bangkok, 10130 Thailand

DATE OF RECEIPT: 19 August 2024 DATE OF ISSUE: 22 August 2024

The report of calibration shall not be reproduced except in full without approval of the Calibration Laboratory Co., Ltd.

Calibrated by: *Sattapong Pindor*
Calibration Engineer

Approved by: *Manoj Kumar*
Authorized Signatory
22 August 2024

The Calibration Certificate documents the traceability to national standards, which under the state of measurement according to the International System of Units (SI).

Certificate No. Q240797
F5-01-0512-23

page 1 of 3



REPORT OF CALIBRATION

FOR

NOMENCLATURE : VACUUM GAUGE
MANUFACTURER : DWYER
MODEL / TYPE : DPFG-40
SERIAL NO. : 21340268
DATE OF CALIBRATION : 20 August 2024

ENVIRONMENT CONDITIONS :
Temperature : (23 ± 2) °C Relative Humidity : (55 ± 10) %RH

PROCEDURE USED :
The instrument was calibrated under procedure No. CLC-CYFF-05 according to EN61010-1 as calibration guidelines.

The calibration was performed by direct measurement with Document Process Calibration and Pressure Module which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :
Document Process Calibration, Plus Model 2110 5.0% 529020 with Pressure Module Model 707070 5.0% 529020

TRACEABILITY :
The measurements are traceable to International System of Units (SI) through National Institute of Standards and Technology (NIST) Certificate No. 10130-14, Date of Issue 01 February 2023.

UNCERTAINTY :
The reported uncertainty is based on a standard uncertainty multiplied by coverage factor of k = 2. It has been evaluated according to the Calibration of Pressure Gauges (G10130-14) which provides a level of confidence approximately 95%.

Certificate No. Q240797
F5-01-0512-23

page 2 of 3



CONCLUSION OF CALIBRATION: ITEM RECEIVED IN GOOD OPERATIONAL CONDITION
MEASUREMENT RESULTS: (N) without adjustment (A) adjustment

The instrument was calibrated by direct measurement with Document Process Calibration and Pressure Module which maintained by the Calibration Laboratory Co., Ltd.

CALIBRATION DATA

Parameter of Standard	Value	Mean of Value	Error	Uncertainty
O2 (vol%)	10.00	10.00	0.04	0.15
CO (vol%)	0.00	0.00	0.01	0.20
CO (ppm)	0.00	0.00	0.01	0.20
NO (vol%)	0.00	0.00	0.01	0.20
NO (ppm)	0.00	0.00	0.01	0.20
NO2 (vol%)	0.00	0.00	0.01	0.20
NO2 (ppm)	0.00	0.00	0.01	0.20
Humidity (H2O) (vol%)	0.00	0.00	0.01	0.20
Humidity (H2O) (ppm)	0.00	0.00	0.01	0.20

Uncertainty of measurement: ± 0.15 vol%

Calibration Date: 22 August 2024

Technical Note: Coverage factor k=2, U=0.15 vol%

Note: The Scope of Accredited ANAB Certificate No. 10130-14, Date of Issue 01 February 2023

This report is valid for the above stated instrument(s) only.

End of Certificate

Certificate No. Q240797
F5-01-0512-23

page 1 of 3



CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : VACUUM GAUGE
MANUFACTURER : QUALITYWELL
MODEL / TYPE : N/A
SERIAL NO. : YG02RYG_F50539
CLID NO. : 21340268
JOB CONTROL NO. : 3410210107
CALIBRATION SERVICE : ☒ IN-LABORATORY ☐ ON-SITE

CUSTOMER : ALS LABORATORY GROUP (THAILAND) CO., LTD.
10130 Phatthanasarak Road, Phatthanasarak, Bangkok, 10130 Thailand

DATE OF RECEIPT: 01 October 2024 DATE OF ISSUE: 04 October 2024

The report of calibration shall not be reproduced except in full without approval of the Calibration Laboratory Co., Ltd.

Calibrated by: *Sattapong Pindor*
Calibration Engineer

Approved by: *Manoj Kumar*
Authorized Signatory
04 October 2024

The Calibration Certificate documents the traceability to national standards, which under the state of measurement according to the International System of Units (SI).

Certificate No. Q240797
F5-01-0512-23

page 1 of 3



REPORT OF CALIBRATION

FOR

NOMENCLATURE : VACUUM GAUGE
MANUFACTURER : QUALITYWELL
MODEL / TYPE : N/A
SERIAL NO. : YG02RYG_F50539
DATE OF CALIBRATION : 03 October 2024

ENVIRONMENT CONDITIONS :
Temperature : (23 ± 2) °C Relative Humidity : (55 ± 10) %RH

PROCEDURE USED :
The instrument was calibrated under procedure No. CLC-CYFF-05 according to EN61010-1 as calibration guidelines.

The calibration was performed by direct measurement with Document Process Calibration and Pressure Module which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :
Document Process Calibration, Plus Model 2110 5.0% 529020 with Pressure Module Model 707070 5.0% 529020

TRACEABILITY :
The measurements are traceable to International System of Units (SI) through National Institute of Standards and Technology (NIST) Certificate No. 10130-14, Date of Issue 01 February 2023.

UNCERTAINTY :
The reported uncertainty is based on a standard uncertainty multiplied by coverage factor of k = 2. It has been evaluated according to the Calibration of Pressure Gauges (G10130-14) which provides a level of confidence approximately 95%.

Certificate No. Q240797
F5-01-0512-23

page 2 of 3



CONDITION OF CALIBRATION ITEM : RECEIVED IN GOOD OPERATIONAL CONDITION

MEASUREMENT RESULTS : (K) without adjustment () adjustment
The DCC was executed by applying a known pressure from its own to full scale 1 time. Then 2 series of known gauge pressure were applied. The STD reading was recorded and the mean value was reported in the table below.

CALIBRATION DATA

DCC Test point (atm)		STD Reading (kPa)		Correction to set		Correction (atm)	
(atm)	Up	Down	Up	Down	Up	Down	
-10.0	-13.82	-13.84	-9.91	-9.94	-0.07	-0.06	
-30.0	-47.79	-47.82	-33.62	-33.63	-0.03	-0.03	
-50.0	-68.41	-68.41	-50.11	-50.11	-0.11	-0.11	
-70.0	-91.34	-91.30	-67.33	-67.34	-0.11	-0.14	
-90.0	-93.33	-93.33	-69.34	-69.34	-0.14	-0.14	

Uncertainty of measurement : 0.01 atm

Transmitting fluid : A/C

Technical Note: Conversion factor : 1 atm = 101.325 kPa

Note: The Scope of Accredited ANAB Certificate No. ACC00-014 Version 012 Page 43 of 47

This report is valid for the above stated instrument's only.

END End of Certificate END

Certificate No. Q24185107

P24185107-01

Page 1 of 3



Certificate of Calibration

Equipment: SPECTROPHOTOMETER

Model: DR3000
Serial No. (or ID): 2021781 (RVO-EN0178)
Manufacturer: HACH
Condition: In Condition

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

Environment Condition: Temperature: 24.1 °C ± 0.5 °C
Humidity: 61.8 %RH ± 1.0 %RH

Calibration Place: ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch) (Wet Chemistry)
616/10 Moo 5 T.Maenam Khui,
A.Pluakdaeng, Rayong 21140, Thailand.

Calibration By: Mr. Nattapong Rungrueang
Calibration Date: 18 September 2023
The Method used: In house method, CAL-WA-24, based 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 Sigma Scientific Limited.
The standard for Wavelength Certificate No. 111583 and 111584
The standard for Photometric Certificate No. 9114964
The standard for Slit Light Certificate No. 111585

(Mr. Nattapong Rungrueang) (Mr. Nattapong Rungrueang)
Person in charge Authorized signatory

The verification is made by the use of measurement standards in the International System of Units (SI) and the traceability of measurement is maintained to national standard or other national standard reference materials.
The measurement uncertainty stated in the reported quantity 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 subject to change from time to time. The results may only be used for the purpose stated and are not to be used for any other purpose without the written approval of CLC Calibration Laboratory Co., Ltd.

Delivering Growth - In Asia and Beyond. CAL-FW-026-13 12 Sep 2022



Certificate No. C04230442 Page 3 of 3

Calibration Results:

Without Adjustment

Standard out/off	UUC: Wavelength (nm)	UUC: Transmission (Kt)	Absorbance (A)
291.64 ± 0.13 nm	351	3.0	1.664

* Calibration Marked * Not TDS Accredited * in this Certificate have been included for completeness.

The End of Certificate

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : VACUUM GAUGE
MANUFACTURER : QUALITYWELL
MODEL / TYPE : N/A
SERIAL NO. : VQ81KVG_F58M21
CLD. NO. : 212380695
JOB CONTR. NO. : 2418021918M
CALIBRATION SERVICE : ☒ IN-LABORATORY ☐ ON-SITE

CUSTOMER : ALS LABORATORY GROUP (THAILAND) CO., LTD.
141 PHRAKRAKAEK RD., PHRAKRAKAEK RD.,
KHAOYANG PHRAKRAKAEK, KHUET YUAN LEANG, BANGKOK 1024, THAILAND

DATE OF RECEIVED : 01 October 2024

DATE OF ISSUED : 01 October 2024

The report of calibration shall not be reproduced except in full without approval of the Calibration Laboratory Co., Ltd.

Calibrated By: Sittapong Plunder
Calibration Engineer

Approved By: Mongkol Yotwongwong
Authorized Signatory
04 October 2024

This Calibration Certificate demonstrates the traceability to national standards, which makes the value of measurement meaningful in the International System of Units (SI).

Certificate No. Q24185104

P24185104-01

Page 1 of 3



REPORT OF CALIBRATION

FOR

NOMENCLATURE : VACUUM GAUGE
MANUFACTURER : QUALITYWELL
MODEL / TYPE : N/A
SERIAL NO. : VQ81KVG_F58M21
DATE OF CALIBRATION : 03 October 2024

ENVIRONMENT CONDITION :
Temperature : (23 ± 1) °C
Relative Humidity : (55 ± 10) %RH

PROCEDURE USED :
The equipment was calibrated under procedure No. CLC-CPP-07 according to ISO 9001-4:4 calibration procedures.
The calibration was performed by direct comparison with known pressure calibration and pressure module which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :
Pressure Process Calibration, Fluke Model 741B 5% 0.00025 with Pressure Module Model 700P01 5% 0.00025.

TRACEABILITY :
The measurement is traceable to International System of Units (SI), through National Institute of Standards (NIST).
Certificate No. MP-000-24, The Date 09 February 2021.

UNCERTAINTY :
The reported uncertainty is based on a standard uncertainty multiplied by coverage factor of k=2. It has been evaluated according to the "Guide to Expression of Uncertainty in Measurement" (GUM) which provides a level of confidence approximately 95%.

Certificate No. Q24185104

P24185104-01

Page 2 of 3



Certificate No. C04230442 Page 2 of 3

Wavelength Accuracy (nm)	The spectral bandwidth of D65 at 5 nm and UVC at 5 nm	Standard Wavelength	Unit Under Calibration	Correction	Uncertainty
418.43	418	0.40	0.50		
527.00	527	1.00	0.50		
636.00	636	0.00	0.50		
747.81	748	-0.39	0.50		
807.34	807	0.04	0.50		

Photometric Accuracy (Absorbance)	Standard Absorbance	Unit Under Calibration	Correction	Uncertainty
Wavelength	0.0000	0.0000	0.0000	0.0045
420 nm	0.2930	0.289	-0.0040	0.0045
	0.5168	0.517	-0.0002	0.0045
	1.0239	1.023	-0.0008	0.0045
440 nm	0.0000	0.0000	0.0000	0.0045
	0.5073	0.506	-0.0013	0.0045
	1.0033	1.003	-0.0003	0.0045
465 nm	0.0000	0.0000	0.0000	0.0045
	0.2516	0.249	-0.0026	0.0045
	0.4681	0.461	-0.0071	0.0045
	0.9234	0.923	-0.0004	0.0045
546.1 nm	0.0000	0.0000	0.0000	0.0045
	0.2461	0.244	-0.0021	0.0045
	0.4652	0.468	+0.0028	0.0045
	0.9468	0.946	-0.0008	0.0045
590 nm	0.0000	0.0000	0.0000	0.0045
	0.2584	0.257	-0.0014	0.0045
	0.5040	0.504	0.0000	0.0045
	1.0012	1.000	-0.0012	0.0045
635 nm	0.0000	0.0000	0.0000	0.0045
	0.2379	0.236	-0.0019	0.0045
	0.4671	0.467	-0.0001	0.0045
	0.9720	0.970	-0.0020	0.0045

Delivering Growth - In Asia and Beyond. CAL-FW-026-13 12 Sep 2022

Certificate of Calibration

Certificate No. 24-MP-000-24 Page 1 of 1

Customer: ALS Laboratory Group (Thailand) Co., Ltd.	Request No: 24-MP-000-24
Name: Mr. Nattapong Rungrueang	
Address: 141 Phrakrakae Rd., Phrakrakae Rd., KhaoYang Phrakrakae, Khuet Yuan Leang, Bangkok 1024, Thailand	
Equipment: VQ81KVG_F58M21	
Model: VQ81KVG_F58M21	
Serial Number: 212380695	
Calibration Date: 03 October 2024	
Calibration Place: 141 Phrakrakae Rd., Phrakrakae Rd., KhaoYang Phrakrakae, Khuet Yuan Leang, Bangkok 1024, Thailand	
Calibration By: Sittapong Plunder	
Calibration Date: 03 October 2024	
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Calibration Place: 141 Phrakrakae Rd., Phrakrakae Rd., KhaoYang Phrakrakae, Khuet Yuan Leang, Bangkok 1024, Thailand	
Calibration By: Sittapong Plunder	
Calibration Date: 03 October 2024	
Calibration Place: 141 Phrakrakae Rd., Phrakrakae Rd., KhaoYang Phrakrakae, Khuet Yuan Leang, Bangkok 1024, Thailand	
Calibration By: Sittapong Plunder	
Calibration Date: 03 October 2024	
Calibration Place: 141 Phrakrakae Rd., Phrakrakae Rd., KhaoYang Phrakrakae, Khuet Yuan Leang, Bangkok 1024, Thailand	
Calibration By: Sittapong Plunder	

Instrument Details

Purpose
This section describes the as found system configuration.

Details

System	
System ID	GM-12
Manufacturer	Agilent Technologies
Name	MSD
File Data Input	Manual Data
Temperature Data Input	Manual Data or Other Data Logging
Isolated Components	
Injection Technique	Injection Tower
Inlet	Front
Detector	External
LSM Installed?	No
Sample 1	
Manufacturer	Agilent Technologies
Type	Injection Tower
Name	7653A
Model Number	G4513A
Serial Number	CH232102
Firmware Revision	A.11.07
Usage	Sample Injection
Location	Front
Spring Volume (µL)	10

Date: May 10, 2024 2:10:53 PM
System ID: GM-12

Sample 2	
Manufacturer	Agilent Technologies
Type	Tier
Name	7653A
Model Number	G4514A
Serial Number	CH231104
Firmware Revision	A.17.03
Vali Header	Not Installed
Mainframe 1	
Manufacturer	Agilent Technologies
Name	8860
Model Number	8860
Serial Number	CH2303A201
Firmware Revision	2.8.1.6
Open Type	Standard
Vali 1	
Manufacturer	Agilent Technologies
Name	8860
Type	SSL
Location	Front
Carrier Gas	Helium
Control Type	Electronic Pressure Control (EPC)
Purged Inlet	Yes
Detector 1	
Manufacturer	Agilent Technologies
Name	Mass Spectrometer
Type	Mass Spectrometer
Location	External

Date: May 10, 2024 2:10:53 PM
System ID: GM-12

Mass Spectrometer 1	
Manufacturer	Agilent Technologies
Type	MS
Name	8877C
Model Number	Q5177C
Serial Number	U52327W435
Firmware Revision	6.00.35
High Vacuum System	Turbo Pump
Scavenging Run Standard	QFN 500
MS ID Source 1	
Manufacturer	Agilent Technologies
Source Type	CI - Extractor
Number of Elements	2

Date: May 10, 2024 2:10:53 PM
System ID: GM-12

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 identifiers and personal passwords. The Agilent representative who has returned the sample understands the meaning and legal status of an electronic signature. As a signed official document, the Agilent representative has a unique identifier 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: Supalak Nimsingtham
Logged On User Name: supalak.nimsingtham@agilent.com
Signature Creation Date: May 10, 2024
Reason for Signature: Executed protocol and uploaded the original version of document

Regulatory Disclaimer

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

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Date: May 10, 2024 2:10:53 PM
System ID: GM-12

User Name: supalak.nimsingtham Report Generated By: supalak.nimsingtham			System ID: GM-12 Print Date: May 10, 2024 2:10:53 PM	
GM-12 (Thyroglobulin)				
Flow	Transaction Date	Activity Performed	Type of Transaction	Optional Information
May 9, 2024 12:59:16 PM	Auto	System Check	System	None
May 9, 2024 12:59:16 PM	Start	Calibration	Calibration	None
May 9, 2024 12:59:16 PM	Auto	Injection	Injection	User's Field Engineer and was performed on-site
May 9, 2024 12:59:16 PM	Auto	Injection	Injection	EDP results for primary injection (EDP)
				EDP results for secondary injection (EDP)
				EDP results for tertiary injection (EDP)
				EDP results for quaternary injection (EDP)
				EDP results for quinary injection (EDP)
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Long Name: Asteroid 2004AG10				Expires: 2018-10-15	
Report generated by Intrinsics 42-01-10-002				Print Date: Wed 10/10/2018 10:47 PM	
ORA-10 Transmittal Page					
Time	Transmittal Date	Accounting Preferred	Type of Transmittal	Outlines & References	
Wed 10/10/2018 1:47 PM	Yes	Complete	WAVE Data: Packed: Waveform	None	
			Wave Form 1: 100, 100		
			Wave 2: 100, 100		
				= 100%	
Wed 10/10/2018 02:40 PM	Auto	Free	Wave Data: Packed: Waveform	Data File Path: 010118	
			Wave Form 1: 100, 100		
			Wave 2: 100, 100		
				= 100%	
Wed 10/10/2018 03:04 PM	Auto	Data	Wave Data: Packed: Waveform	Data File Path: 010118	
			Wave Form 1: 100, 100		
			Wave 2: 100, 100		
				= 100%	
Wed 10/10/2018 04:04 PM	Auto	Data	Wave Data: Packed: Waveform	Data File Path: 010118	
			Wave Form 1: 100, 100		
			Wave 2: 100, 100		
				= 100%	
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			Wave Form 1: 100, 100		
			Wave 2: 100, 100		
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				= 100%	
Wed 10/10/2018 04:04 PM	Auto	Data	Wave Data: Packed: Waveform	Data File Path: 010118	
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Wed 10/10/2018 04:04 PM	Auto	Data	Wave Data: Packed: Waveform	Data File Path: 010118	
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			Wave 2: 100, 100		
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Wed 10/10/2018 04:04 PM	Auto	Data	Wave Data: Packed: Waveform	Data File Path: 010118	
			Wave Form 1: 100, 100		
</					

Date: May 11, 2024 2:18:55 PM
System ID: CNA-12

[illegible]



Stopwatch Calibration Report

Calibration Date : 10 Jul 24

Barometric Pressure (mmHg) : 752.4

Relative Humidity (%) : 64.0

Reference Stopwatch Data

Stopwatch ID No. : RYG_F02540

Model : F308

Serial No. : E18061

Calibration Date : 4 Jul 24

Certificate No. : E-2407022

Next Cal Date : 10 Jan 25

Temperature (°C) : 29.2


Console Control Meter Data

Dry Gas Meter No. RYG_F02315


Model : XC-572-V

Serial No. : 1706091

Run No	Time Actual (mins:ms)	Time Reading (mins)	Diff. (ms)	Diff. (mins)
1	0:00:03	5:00	3	0.00006
2	3:00:08	5:00	8	0.00013
3	5:00:07	5:00	7	0.00012
4	3:00:08	5:00	8	0.00013
5	5:00:05	5:00	5	0.00006
6	3:00:06	5:00	6	0.00010
7	3:00:06	5:00	6	0.00010
8	3:00:07	5:00	7	0.00012
9	3:00:08	5:00	8	0.00013
10	5:00:07	5:00	7	0.00012
			Average	0.00011
			SD	0.00003

Calibrate by: 

Mr. Rishi Phrasphor


Approved by: 

Mr. Nithesh Jengamrangan

RYG Field Service (Sri Lanka) (P) Ltd.

RYG Field Service (Sri Lanka) (P) Ltd.

PROBE NOZZLE DIAMETER CALIBRATION DATA SHEET					
Calibration Date: 10/21/20		Headsie Scan ID: 1		HVS #32318	
Calibration Sheet No.: C-1027244HVS #32318		Vaporizer Caliper ID:		BOM #51123	
Headsie ID #	Headsie Diameter (mm.)			ID - Ls	ID - D ₂ / D ₃
	D ₁	D ₂	D ₃		
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	0.606	0.605	0.000	0.605
4	0.772	0.780	0.785	0.010	0.783
5	0.930	0.928	0.930	0.002	0.929
6	1.062	1.060	1.063	0.005	1.062
7	1.240	1.230	1.235	0.010	1.235
8	1.594	1.558	1.551	0.043	1.568



Type S Pitot Tube Calibration

Date Calibration

Pitot ID

Pitot Size

10-Jul-24

RVG_F50321

=

Due Date


Indinometer ID

Vernier ID

10-Jan-25

BKF_F51311

RVG_F50329



Parameter	Value	Allowable Range	Check
G1	-3.4	-10° < G1 < +10°	OK
G2	-0.2	-10° < G2 < +10°	OK
P1	0.8	-5° < P1 < +5°	OK
P2	-0.4	-5° < P2 < +5°	OK
Y	0.6	-	-
Y	0.5	-	-
Z = A tan Y	0.011	Z < 0.125°	OK
W = A tan Z	0.000	W < 0.031°	OK
G1	0.310	0.168° to 0.375°	OK
A/Z01	1.484	1.05 < PA/Z01 < 1.5	OK

Certify that pitot tube/porbe meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube certification fact of 0.04. See (a) CFR 83.60, App. A, EPA Method 2

(Mr Subash Prasadgoudar)	(Mr Kishore Jangamurthy)
RTG Field Service Specialist (4)	RTG Field Service Specialist (1)

Calibrated by: (Mr. Sakshi Phacarnphaisat)
RYG Field Services Scientist (4)

Approved By: (Mr. Nithaporn Jongsamranwong)
RYG Field Services Specialist (1)

FORM NO. F 36-017 REVISION NO. 2 ISSUE DATE: 10/03/2017

FORM NO. 106-134, REVISED NO. 2, ISSUE DATE 7/10/10

Entity accredited according to **CSN EN ISO/IEC 17025:2018**

ALS Czech Republic, s.r.o.
Na Hradě 336/9, 190 00 Praha 9 - Vysočany

Ordnal number ^a	Test procedure/verbal exam	Test procedure/verbal identification ^b	Subject of the test
I.116f	Determination of easily detectable chemical (like chemical and/or crystal detection) by weak acid or spectrophotometry	CF, SOP 156 03, 204 B (CAN EN 157 173) CAN EN 104 443-2, 104 440-2 (C)	Isolates samples ^c Isolating materials ^d Containers for building ^e
I.117f	Determination of foundation by electrochemical method (P282)	CF, SOP 156 03, 204 B (CAN EN 104 443-2, 104 440-2 (C))	Water ^f , isolates ^g
I.118f	Determination of chemical oxygen demand (COD) (P282) by titrimetric	CF, SOP 156 03, 204 B (CAN EN 104 443-2, 104 440-2 (C))	Water ^f , isolates ^g
I.119f	Determination of total organic carbon (TOC) following irradiance to nitrogen oxides by chemical oxygen demand detection	CF, SOP 156 03, 204 B (CAN EN 11230)	Water ^f , isolates ^g
I.120f	Determination of total organic carbon (TOC) following irradiance to nitrogen oxides by IR detection	CF, SOP 156 03, 204 B (CAN EN 11240)	Water ^f , isolates ^g
I.121f	Chemical determination of carbon fibers by polarisation microscope	CF, SOP 156 03, 204 B (NDSH 10304)	Isolates samples ^c (except liquid waste, suspended, dissolved materials) Containers for building ^e
I.122f	Determination of mercury by fluorescence spectrometry	CF, SOP 156 03, 096 (US EPA 245.7) CF, SOP 156 03, 182 (US EPA 8152)	Water ^f , isolates ^g
I.123f	Determination of mercury by fluorescence spectrometry	CF, SOP 156 03, 096 (CAN EN 157 173) P/A Application Note 025, 101872-2002	Isolates samples ^c Isolating materials ^d Containers for building ^e
I.124f	Reserved		
I.125f	Determination of mercury by fluorescence spectrometry	CF, SOP 156 03, 096 (CAN EN 157 173) CAN EN 13311 CF, SOP 156 03, 182 (US EPA 8152)	Water ^f , isolates ^g
I.126f - I.127f	Reserved		
I.128f	Determination of dissolved inorganic, chloride and chlorine by ion liquid chromatography and calculation of the sum of chloride and chlorine from measured values	CF, SOP 156 03, 096 (CAN EN 157 173) CAN EN 15001 CAN EN 10304-2	Water ^f , isolates ^g
I.129f	Determination of chloride by titrimetric spectrometry	CF, SOP 156 03, 099 (US EPA 325.1) CAN 4500-C	Water ^f , isolates ^g
I.130f	Determination of radiative substances by gamma-ray	CF, SOP 156 03, 200 (CAN EN 7538) CAN 55300	Water ^f
I.131f	Determination of reactive and non-reactive aluminum by continuous flow analysis (CFA) spectrophotometrically and calculation of labile aluminum	CF, SOP 156 03, 191 (SEALAP, Company method)	Drinking, surface water
I.132f	Determination of metal compounds by mobile analysis	CF, SOP 156 07, 163	Isolates samples ^c

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ALS Czech Republic, s.r.o.
Na Hradě 114/2, 100 00 Praha 2 - Vyšehrad

Ordinal number	Test procedure/worked version	Test procedure/worked identification ¹	Subject of the test
1.150 ²	Determination of water, sulphate, chlorine, fluorine and volatile by calculation from the measured values of bromine, iodine, fluoride and sulphate by IC coupled after burning the sample	EN 506 506 001, 133 (EN 506 510 900-1, 900-2, 900-3, 900-4, 900-5, 900-6, 900-7, 900-8, 900-9, 900-10, 900-11, 900-12, 900-13, 900-14, 900-15, 900-16, 900-17, 900-18, 900-19, 900-20, 900-21, 900-22, 900-23, 900-24, 900-25, 900-26, 900-27, 900-28, 900-29, 900-30, 900-31, 900-32, 900-33, 900-34, 900-35, 900-36, 900-37, 900-38, 900-39, 900-40, 900-41, 900-42, 900-43, 900-44, 900-45, 900-46, 900-47, 900-48, 900-49, 900-50, 900-51, 900-52, 900-53, 900-54, 900-55, 900-56, 900-57, 900-58, 900-59, 900-60, 900-61, 900-62, 900-63, 900-64, 900-65, 900-66, 900-67, 900-68, 900-69, 900-70, 900-71, 900-72, 900-73, 900-74, 900-75, 900-76, 900-77, 900-78, 900-79, 900-80, 900-81, 900-82, 900-83, 900-84, 900-85, 900-86, 900-87, 900-88, 900-89, 900-90, 900-91, 900-92, 900-93, 900-94, 900-95, 900-96, 900-97, 900-98, 900-99, 900-100, 900-101, 900-102, 900-103, 900-104, 900-105, 900-106, 900-107, 900-108, 900-109, 900-110, 900-111, 900-112, 900-113, 900-114, 900-115, 900-116, 900-117, 900-118, 900-119, 900-120, 900-121, 900-122, 900-123, 900-124, 900-125, 900-126, 900-127, 900-128, 900-129, 900-130, 900-131, 900-132, 900-133, 900-134, 900-135, 900-136, 900-137, 900-138, 900-139, 900-140, 900-141, 900-142, 900-143, 900-144, 900-145, 900-146, 900-147, 900-148, 900-149, 900-150, 900-151, 900-152, 900-153, 900-154, 900-155, 900-156, 900-157, 900-158, 900-159, 900-160, 900-161, 900-162, 900-163, 900-164, 900-165, 900-166, 900-167, 900-168, 900-169, 900-170, 900-171, 900-172, 900-173, 900-174, 900-175, 900-176, 900-177, 900-178, 900-179, 900-180, 900-181, 900-182, 900-183, 900-184, 900-185, 900-186, 900-187, 900-188, 900-189, 900-190, 900-191, 900-192, 900-193, 900-194, 900-195, 900-196, 900-197, 900-198, 900-199, 900-200, 900-201, 900-202, 900-203, 900-204, 900-205, 900-206, 900-207, 900-208, 900-209, 900-210, 900-211, 900-212, 900-213, 900-214, 900-215, 900-216, 900-217, 900-218, 900-219, 900-220, 900-221, 900-222, 900-223, 900-224, 900-225, 900-226, 900-227, 900-228, 900-229, 900-230, 900-231, 900-232, 900-233, 900-234, 900-235, 900-236, 900-237, 900-238, 900-239, 900-240, 900-241, 900-242, 900-243, 900-244, 900-245, 900-246, 900-247, 900-248, 900-249, 900-250, 900-251, 900-252, 900-253, 900-254, 900-255, 900-256, 900-257, 900-258, 900-259, 900-260, 900-261, 900-262, 900-263, 900-264, 900-265, 900-266, 900-267, 900-268, 900-269, 900-270, 900-271, 900-272, 900-273, 900-274, 900-275, 900-276, 900-277, 900-278, 900-279, 900-280, 900-281, 900-282, 900-283, 900-284, 900-285, 900-286, 900-287, 900-288, 900-289, 900-290, 900-291, 900-292, 900-293, 900-294, 900-295, 900-296, 900-297, 900-298, 900-299, 900-300, 900-301, 900-302, 900-303, 900-304, 900-305, 900-306, 900-307, 900-308, 900-309, 900-310, 900-311, 900-312, 900-313, 900-314, 900-315, 900-316, 900-317, 900-318, 900-319, 900-320, 900-321, 900-322, 900-323, 900-324, 900-325, 900-326, 900-327, 900-328, 900-329, 900-330, 900-331, 900-332, 900-333, 900-334, 900-335, 900-336, 900-337, 900-338, 900-339, 900-340, 900-341, 900-342, 900-343, 900-344, 900-345, 900-346, 900-347, 900-348, 900-349, 900-350, 900-351, 900-352, 900-353, 900-354, 900-355, 900-356, 900-357, 900-358, 900-359, 900-360, 900-361, 900-362, 900-363, 900-364, 900-365, 900-366, 900-367, 900-368, 900-369, 900-370, 900-371, 900-372, 900-373, 900-374, 900-375, 900-376, 900-377, 900-378, 900-379, 900-380, 900-381, 900-382, 900-383, 900-384, 900-385, 900-386, 900-387, 900-388, 900-389, 900-390, 900-391, 900-392, 900-393, 900-394, 900-395, 900-396, 900-397, 900-398, 900-399, 900-400, 900-401, 900-402, 900-403, 900-404, 900-405, 900-406, 900-407, 900-408, 900-409, 900-410, 900-411, 900-412, 900-413, 900-414, 900-415, 900-416, 900-417, 900-418, 900-419, 900-420, 900-421, 900-422, 900-423, 900-424, 900-425, 900-426, 900-427, 900-428, 900-429, 900-430, 900-431, 900-432, 900-433, 900-434, 900-435, 900-436, 900-437, 900-438, 900-439, 900-440, 900-441, 900-442, 900-443, 900-444, 900-445, 900-446, 900-447, 900-448, 900-449, 900-450)	Chl, liquid tests, customizable liquid and solid wastes
1.151 ²	Determination of laboratory compound with density (LCBD)	EN 506 506 001, 133 (EN 506 13049)	Waste, compounds, tests and procedures
1.152 ²	Determination of electrical conductivity	EN 506 506 001, 136 (EN 506 13049, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 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2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 2681, 2682, 2683, 2684, 2685, 2686, 2687, 2688, 2689, 2690, 2691, 2692, 2693, 2694, 2695, 2696, 2697, 2698, 2699, 2700, 2701, 2702, 2703, 2704, 2705,	

Environ Monit Assess (2015) 189:1507–1518

ALS Czech Republic, s.r.o.
Na Hrádkě 336/9, 190 00 Praha 9 - Vysočany

Orbital number	Test procedure/orbital number	Test procedure/orbital identification ¹	Subject of the test
2.12 ²	Determination of organic compounds ³ by gas chromatography method with MS detector and calculation of organic compounds mass from measured values	US EPA 8210, 10, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 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998, 999, 1000	Water (solid trace, leachables), sediment, soil, rocks
2.13 ¹	Determination of phenols and cresols ⁴ by gas chromatography method with MS detector and calculation of phenols and cresols mass from measured values	US EPA 8210, 10, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 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797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000	Water (solid trace, leachables), sediment, soil, rocks
2.14 ¹	Determination of phenols and cresols ⁴ by gas chromatography method with MS detector and calculation of phenols and cresols mass from measured values	US EPA 8210, 10, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509,	

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Entity accredited according to ČSN EN ISO/IEC 17025:2018:

ALS Czech Republic, s.r.o.
Na Harfě 3369, 190 00 Praha 9 - Vysočany

Order number	Test procedure/analytical method	Test procedure/analytical method/identification	Subject of the test
949	Determination of copper by ICP-MS (inductively coupled plasma mass spectrometry) method with ICP detection	ČZ 509 009 01, 004 (ČSN EN 15610)	Food, feed, dietary supplements
947	Determination of ethanol after distillation by gravimetry	ČZ 509 009 01, 005 (ČSN EN 15610), ČSN EN 15610, ČSN EN 15610, ČSN EN 15610	Alcoholic beverages

Annex

Variable scope of accreditation

Order numbers of tests

11-112, 113-114, 114-146, 146-148, 148-149, 149-150, 150-151, 151-152, 152-153, 153-154, 154-155, 155-156, 156-157, 157-158, 158-159, 159-160, 160-161, 161-162, 162-163, 163-164, 164-165, 165-166, 166-167, 167-168, 168-169, 169-170, 170-171, 171-172, 172-173, 173-174, 174-175, 175-176, 176-177, 177-178, 178-179, 179-180, 180-181, 181-182, 182-183, 183-184, 184-185, 185-186, 186-187, 187-188, 188-189, 189-190, 190-191, 191-192, 192-193, 193-194, 194-195, 195-196, 196-197, 197-198, 198-199, 199-200, 200-201, 201-202, 202-203, 203-204, 204-205, 205-206, 206-207, 207-208, 208-209, 209-210, 210-211, 211-212, 212-213, 213-214, 214-215, 215-216, 216-217, 217-218, 218-219, 219-220, 220-221, 221-222, 222-223, 223-224, 224-225, 225-226, 226-227, 227-228, 228-229, 229-230, 230-231, 231-232, 232-233, 233-234, 234-235, 235-236, 236-237, 237-238, 238-239, 239-240, 240-241, 241-242, 242-243, 243-244, 244-245, 245-246, 246-247, 247-248, 248-249, 249-250, 250-251, 251-252, 252-253, 253-254, 254-255, 255-256, 256-257, 257-258, 258-259, 259-260, 260-261, 261-262, 262-263, 263-264, 264-265, 265-266, 266-267, 267-268, 268-269, 269-270, 270-271, 271-272, 272-273, 273-274, 274-275, 275-276, 276-277, 277-278, 278-279, 279-280, 280-281, 281-282, 282-283, 283-284, 284-285, 285-286, 286-287, 287-288, 288-289, 289-290, 290-291, 291-292, 292-293, 293-294, 294-295, 295-296, 296-297, 297-298, 298-299, 299-300, 300-301, 301-302, 302-303, 303-304, 304-305, 305-306, 306-307, 307-308, 308-309, 309-310, 310-311, 311-312, 312-313, 313-314, 314-315, 315-316, 316-317, 317-318, 318-319, 319-320, 320-321, 321-322, 322-323, 323-324, 324-325, 325-326, 326-327, 327-328, 328-329, 329-330, 330-331, 331-332, 332-333, 333-334, 334-335, 335-336, 336-337, 337-338, 338-339, 339-340, 340-341, 341-342, 342-343, 343-344, 344-345, 345-346, 346-347, 347-348, 348-349, 349-350, 350-351, 351-352, 352-353, 353-354, 354-355, 355-356, 356-357, 357-358, 358-359, 359-360, 360-361, 361-362, 362-363, 363-364, 364-365, 365-366, 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1299-1300, 1300-1301, 1301-1302, 1302-1303, 1303-1304, 1304-1305, 1305-1306, 1306-1307, 1307-1308, 1308-1309, 1309-1310, 1310-1311, 1311-1312, 1312-1313, 1313-1314, 1314-1315, 1315-1316, 1316-1317, 1317-1318, 1318-1319, 1319-1320, 1320-1321, 1321-1322, 1322-1323, 1323-1324, 1324-1325, 1325-1326, 1326-1327, 1327-1328, 1328-1329, 1329-1330, 1330-1331, 1331-1332, 1332-1333, 1333-1334, 1334-1335, 1335-1336, 1336-1337, 1337-1338, 1338-1339, 1339-1340, 1340-1341, 1341-1342, 1342-1343, 1343-1344, 1344-1345, 1345-1346, 1346-1347, 1347-1348, 1348-1349, 1349-1350, 1350-1351, 1351-1352, 1352-1353, 1353-1354, 1354-1355, 1355-1356, 1356-1357, 1357-1358, 1358-1359, 1359-1360, 1360-1361, 1361-1362, 1362-1363, 1363-1364, 1364-1365, 1365-1366, 1366-1367, 1367-1368, 1368-1369, 1369-13



ROTA METER CALIBRATION RESULT JULY 2024

Rotameter ID	Calibration Date	Regression Result	Coefficient (R ²)
BKQ_F50287	02 Jul 24	$Y = 1.0031x + 0.0433$	1.0000
BKQ_F50288	02 Jul 24	$Y = 1.0006x + 2.7074$	0.9999
BKQ_F50289	02 Jul 24	$Y = 1.0315x + 3.0033$	0.9999
BKQ_F50290	02 Jul 24	$Y = 1.0294x + 0.71$	1.0000
BKQ_F50291	02 Jul 24	$Y = 0.9751x + 0.8452$	0.9999
BKQ_F50292	02 Jul 24	$Y = 1.0023x + 14.273$	1.0000
BKQ_F50293	02 Jul 24	$Y = 1.0003x + 7.0099$	1.0000
BKQ_F50294	02 Jul 24	$Y = 1.0071x + 114.97$	0.9995
BKQ_F50295	02 Jul 24	$Y = 0.9826x + 13.51$	0.9999
BKQ_F50296	02 Jul 24	$Y = 1.0217x + 0.5833$	0.9997
BKQ_F50297	02 Jul 24	$Y = 1.149x + 1.0422$	0.9991
BKQ_F50298	02 Jul 24	$Y = 1.1116x + 3.3558$	0.9994
BKQ_F50299	02 Jul 24	$Y = 1.1273x + 0.4837$	0.9999
BKQ_F50300	02 Jul 24	$Y = 1.0944x + 0.2545$	1.0000
BKQ_F50301	02 Jul 24	$Y = 1.0499x + 2.2027$	0.9999
BKQ_F50302	02 Jul 24	$Y = 1.0173x + 0.1967$	0.9999
BKQ_F50303	02 Jul 24	$Y = 1.0223x + 5.619$	1.0000
BKQ_F50304	02 Jul 24	$Y = 1.072x + 2.4654$	1.0000
BKQ_F50305	02 Jul 24	$Y = 1.0194x + 4.4788$	0.9999
BKQ_F50306	02 Jul 24	$Y = 1.0009x + 3.7755$	1.0000
BKQ_F50307	02 Jul 24	$Y = 1.1115x + 4.4431$	0.9995
BKQ_F50308	02 Jul 24	$Y = 1.0159x + 0.365$	1.0000
BKQ_F50309	02 Jul 24	$Y = 0.9973x + 5.2371$	0.9999
BKQ_F50310	02 Jul 24	$Y = 0.9802x + 0.5833$	0.9992
BKQ_F50311	02 Jul 24	$Y = 1.0034x + 2.5343$	1.0000
BKQ_F50312	02 Jul 24	$Y = 1.0519x + 1.1272$	0.9996
BKQ_F50313	02 Jul 24	$Y = 1.0015x + 10.387$	0.9995
BKQ_F50314	02 Jul 24	$Y = 0.9995x + 0.2743$	0.9999
BKQ_F50315	02 Jul 24	$Y = 1.1257x + 0.4231$	0.9991
BKQ_F50316	02 Jul 24	$Y = 1.0237x + 0.1016$	0.9994
BKQ_F50317	02 Jul 24	$Y = 0.9971x + 5.0031$	0.9995
BKQ_F50318	02 Jul 24	$Y = 0.7378x + 301.39$	0.9134
BKQ_F50319	02 Jul 24	$Y = 1.0722x + 3.4369$	0.9998
BKQ_F50320	02 Jul 24	$Y = 1.0254x + 1.04$	1.0000
BKQ_F50321	02 Jul 24	$Y = 0.9999x + 12.73$	1.0000
BKQ_F50322	02 Jul 24	$Y = 1.0045x + 10.261$	1.0000
BKQ_F50323	02 Jul 24	$Y = 1.0056x + 1.9883$	1.0000
BKQ_F50324	02 Jul 24	$Y = 1.0026x + 3.2381$	0.9999

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ROTA METER CALIBRATION RESULT JULY 2024

Rotameter ID	Calibration Date	Regression Result	Coefficient (R ²)
RYG_F50354	02 Jul 24	$Y = 1.0421x + 1.4638$	1.0000
RYG_F50355	02 Jul 24	$Y = 0.9751x + 15.2$	0.9994
RYG_F50356	02 Jul 24	$Y = 1.0942x + 7.1067$	0.9999
RYG_F50357	02 Jul 24	$Y = 1.0371x + 1.9519$	0.9999
RYG_F50358	02 Jul 24	$Y = 0.9921x + 10.87$	0.9996
RYG_F50359	02 Jul 24	$Y = 1.0022x + 8.4152$	1.0000
SGK_F50135	02 Jul 24	$Y = 1.0193x + 3.6833$	0.9999
SGK_F50136	02 Jul 24	$Y = 1.0217x + 1.63$	1.0000
SGK_F50137	02 Jul 24	$Y = 1.059x + 4.5833$	0.9999
SGK_F50138	02 Jul 24	$Y = 1.0154x + 3.74$	0.9999
SGK_F50139	02 Jul 24	$Y = 1.0099x + 13.353$	1.0000
SGK_F50140	02 Jul 24	$Y = 1.1185x + 1.4867$	0.9998
SGK_F50141	02 Jul 24	$Y = 1.0211x + 1.39$	1.0000
SGK_F50142	02 Jul 24	$Y = 1.0045x + 5.6961$	1.0000

Review By: Wichan Choochuan
(Mr. Wichan Choochuan)
Senior Field Services Manager

Approved By: Mr. Sarayuth Sitratan
(Mr. Sarayuth Sitratan)
Assistant General Manager

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ALS Laboratory Group



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-670292

CALIBRATION CERTIFICATE

MTC No. EEL-EP-835287

Submitted by: ALS Laboratory Group (Thailand) Co., Ltd.
Address: 104 Phrasarakon Rd., Phrasarakon Rd., Khwaeng Phrasarakon, Khet San Luang, Bangkok, 10250
Calibrated at: Floor of 1st Electronic Standards Laboratory, Industrial Metrology and Testing Service Centre
San 1C, Pungwa Industrial Estate, Subhachulalongkornrajavidyalaya Rd., Muang, Samutprakan 10289

Instrument Calibrated: Ambient Environment
Description: Sound Calibrator
Temperature: (23 ± 0.1) °C
Manufacturer: Fluke
Relative Humidity: (50 ± 10)%
Model: 42C-74
Ambient Pressure: (101.325 ± 1.500) kPa
Serial No.: 1478121 (ID: RYG_F50203)

- Standards used:
1. Digital Function Synthesizer NF Electronic DE-191A SN 12207
 2. Measuring Amplifier Bridge/Range 256 SN 151748
 3. Programmable Attenuator Targuana IPA-303A SN 07224
 4. Digital Multimeter Agilent 34401A SN MY4003560
 5. Pressure Transducer Vaisala PHT020AD SN MY4003560
 6. Audio Analyzer Kaitley 2015-P SN 419495
 7. Condenser Microphone B&K 4150 SN 1080571

Calibration Procedure: CP-102-02 based on IEC 60942-2003. The sound pressure level is generated by sound calibrator reference shall be measured by standard microphone using an electrostatic reference.

This instrument has been calibrated against standards maintained at Electronic and Electrical Standards Laboratory (EEL), which are traceable to the International System of Units through the National Institute of Metrology (Thailand).

The information on actual testing is attached herewith and the uncertainty limits quoted refer to the measured values only.

Date of Receipt: 19 Jul 2024
Date of Calibration: 18 Feb 2024

The results of this calibration are valid for the period of validity stated on the certificate.

Address: 104 Phrasarakon Rd., Phrasarakon Rd., Khwaeng Phrasarakon, Khet San Luang, Bangkok, 10250
Tel: 02-261-1111
Fax: 02-261-1111
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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-670292 MTC No. EEL-EP-835287

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%.

Normal Output of Under Test = 94 dB re 20 μPa at 1000 Hz

Acoustic Output in dB re 20 μPa, Corrected to Reference Conditions: 101.325 kPa, 23.0 °C and 50% RH.

1. Sound Pressure Level

Standard Microphone	Measured Sound Pressure Level (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit (dB)
1/2 inch BrüelKjær 4130	94.01	0.01	± 0.10	± 0.40 dB

2. Frequency

Standard Microphone	Measured Frequency (Hz)	Deviated value (Hz)	Uncertainty (Hz)	Tolerance limit (Hz)
1/2 inch BrüelKjær 4130	1000.1	0.1	± 1.5	± 0.0%

3. Total Uncertainty

Standard Microphone	Measured Total Uncertainty (%)	Deviated value (%)	Uncertainty (%)	Tolerance limit (%)
1/2 inch BrüelKjær 4130	1.89	± 0.39	± 0.0%	± 0.0%

Note: 1. No adjustment.

2. The calibration pressure correction was not included.

3. The microphone volume correction was included at level of 0.16 dB from reference.

Calibrated by: Wichan Choochuan Approved by: Mr. Sarayuth Sitratan

(Mr. Wichan Choochuan) (Mr. Sarayuth Sitratan)

Electrical and Electronic Standards Laboratory
Industrial Metrology and Testing Service Centre
Ref: 2024071900719001

Date of Calibration: 18 Feb 2024
Date of Issue: 29 Feb 2024

End of Certificate

Head Office: 104 Phrasarakon Rd., Phrasarakon Rd., Khwaeng Phrasarakon, Khet San Luang, Bangkok, 10250
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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-670292 MTC No. EEL-EP-835287

1. Absolute Sensitivity

Reference	Measured value	Deviated value	Accepted Uncertainty	Maximum permitted uncertainty of measurement
Acoustic output (dB)	94.01	0.01	± 0.10	± 0.40

Note: The external calibration adjustment was fully performed. The internal calibration adjustment was not performed at the display of 121.8 dB.

2. Self-generated noise

Measured value	Uncertainty	Maximum permitted uncertainty of measurement
17.8	0.10	N/A

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

Frequency	Measured value	Deviated value	Accepted Uncertainty	Maximum permitted uncertainty of measurement
Weighting	11.7	0.10	± 0.10	± 0.40

Frequency	Measured value	Deviated value	Accepted Uncertainty	Maximum permitted uncertainty of measurement
A-weight	11.7	0.10	± 0.10	± 0.40
C-weight	11.7	0.10	± 0.10	± 0.40
Flat	11.7	0.10	± 0.10	± 0.40

Date of Calibration: 23 Feb 2024 1 Mar 2024

Head Office: 104 Phrasarakon Rd., Phrasarakon Rd., Khwaeng Phrasarakon, Khet San Luang, Bangkok, 10250
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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-670292 MTC No. EEL-EP-835287

CALIBRATION CERTIFICATE

Submitted by: ALS Laboratory Group (Thailand) Co., Ltd.
Address: 104 Phrasarakon Rd., Phrasarakon Rd., Khwaeng Phrasarakon, Khet San Luang, Bangkok, 10250
Calibrated at: Floor of 1st Electronic Standards Laboratory, Industrial Metrology and Testing Service Centre
San 1C, Pungwa Industrial Estate, Subhachulalongkornrajavidyalaya Rd., Muang, Samutprakan 10289

Instrument Calibrated: Ambient Environment
Description: Sound Level Meter
Temperature: (23 ± 0.1) °C
Manufacturer: Rion
Relative Humidity: (50 ± 10)%
Model: NT-42
Ambient Pressure: (101.325 ± 1.5) kPa
Serial No.: 069-0972 (ID: RYG_F50493)
Microphone: IEC-62 No. 184645
Pre-amplifier: 101-24 No. 01734

- Standards used:
1. Band Pass Filter Wavelet 752A SN 90010454
 2. Condenser Microphone BrüelKjær 4130 SN 289491
 3. Decade Attenuator Audio AL 200 SN 0044602
 4. Function/Arbitrary Waveform Generator Agilent 33220A SN MY4003560
 5. Digital Function Synthesizer NF Electronic Instruments DE-191A SN 12207
 6. Digital Multimeter Fluke 825A SN 4858107
 7. Pinpointe Rion NC-92 SN 69402446
 8. Measuring Amplifier BrüelKjær 2636 SN 1517444

Date of Receipt: 19 Jul 2024
Date of Calibration: 23 Feb 2024 1 Mar 2024

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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-670292 MTC No. EEL-EP-835287

3. Acoustical signal test of frequency weighting

Frequency	Measured value	Deviated value	Accepted Uncertainty	Maximum permitted uncertainty of measurement
100	94.01	0.01	± 0.10	± 0.40
1000	94.01	0.01	± 0.10	± 0.40
10000	94.01	0.01	± 0.10	± 0.40

4. Electrical signal test of frequency weighting

Frequency	Measured value	Deviated value	Accepted Uncertainty	Maximum permitted uncertainty of measurement
100	94.01	0.01	± 0.10	± 0.40
1000	94.01	0.01	± 0.10	± 0.40
10000	94.01	0.01	± 0.10	± 0.40

Date of Calibration: 23 Feb 2024 1 Mar 2024

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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-670292 MTC No. EEL-EP-835287

9. Power Amplifier BrüelKjær 2706 SN 1517450
10. Synchro Tuning Unit, Great Britain Rotolux Patra SA 214501
11. Digital Multimeter Agilent 34401A SN MY4003560
12. Programmable Attenuator Targuana IPA-303A SN 07224

Calibration Procedure: This instrument was calibrated by using calibration procedures as CP-102-02 and CP-102-03, which were based on IEC 61672-3 Electroacoustics - Sound Level Meters - Part 3: Precision series (2013). These calibration procedures were related to the electrical and acoustic signal tests. The electrical signal test was carried out in the direct measurement method. The acoustic signal test was performed in an anechoic room with the computer measurement method.

This instrument has been calibrated against standards maintained at the 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 testing is attached herewith and the uncertainty limits are quoted refer to the measured values only.

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%.

Date of Calibration: 23 Feb 2024 1 Mar 2024

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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-670292 MTC No. EEL-EP-835287

5. Long-term stability

Time	Measured value	Deviated value	Accepted Uncertainty	Maximum permitted uncertainty of measurement
100	94.01	0.01	± 0.10	± 0.40
1000	94.01	0.01	± 0.10	± 0.40
10000	94.01	0.01	± 0.10	± 0.40

Note: The external calibration adjustment was fully performed. The internal calibration adjustment was not performed at the display of 121.8 dB.

Frequency	Measured value	Deviated value	Accepted Uncertainty	Maximum permitted uncertainty of measurement
Weighting	11.7	0.10	± 0.10	± 0.40

Frequency	Measured value	Deviated value	Accepted Uncertainty	Maximum permitted uncertainty of measurement
A-weight	11.7	0.10	± 0.10	± 0.40
C-weight	11.7	0.10	± 0.10	± 0.40
Flat	11.7	0.10	± 0.10	± 0.40

Frequency	Measured value	Deviated value	Accepted Uncertainty	Maximum permitted uncertainty of measurement
100	94.01	0.01	± 0.10	± 0.40
1000	94.01	0.01	± 0.10	± 0.40
10000	94.01	0.01	± 0.10	± 0.40

Frequency	Measured value	Deviated value	Accepted Uncertainty	Maximum permitted uncertainty of measurement
Weging	(g)	(g)	(g)	(g)
Fast	94.0	0.0	0.1	0.2

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)
Request No. 21-670232
7. Level linearity on the reference level range
MTC No. EEL BP. 1770167

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)
Request No. 21-670232
7. Level linearity on the reference level range (cont.)
MTC No. EEL BP. 1770167

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)
Request No. 21-670232
8. Level linearity including the level range control
MTC No. EEL BP. 1770167

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)
Request No. 21-670232
10. Peak C sound level
MTC No. EEL BP. 1770167

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
Calibration Certificate
SOUND LEVEL METER
Model: NL-42A / Microphone UC-52 / Preamp/Filter N01-24

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
Calibration Procedure: CP-AC-01
Calibration Method:
This equipment was calibrated by follow on IEC 61672-3 (2012) Standard for sound level meter (SLM).

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
Summary of Measurement Result
Parameter: Absolute sensitivity, Self-generated noise, Acoustical signal tests of frequency weightings

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
Detail of calibration
1. Absolute sensitivity
Reference: Absolute Signal (dB)
Measured Value (dB)
Deviation (dB)
Acceptance Limit (dB)

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
4. Electrical signal tests of frequency weightings
Frequency (Hz)
Measured Value (dB)
Deviation (dB)
Acceptance Limit (dB)
5. Frequency and time weightings at 1 kHz

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Cert. No.: ACL24010
Job No.: VC67AC0844
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	44.0	0.0	+1.1
39.0	38.9	-0.1	+1.1
34.0	33.9	-0.1	+1.1
29.0	28.9	-0.1	+1.1
24.0	23.9	-0.1	+1.1
19.0	18.9	-0.1	+1.1
14.0	13.9	-0.1	+1.1

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Cert. No.: ACL24010
Job No.: VC67AC0844
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	Time burst duration, Th	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	100	134.0	134.0	0.0	+1.0
Slow	2	8	108.0	108.0	0.0	1.5, -5.0
	0.25	1	99.0	98.9	-0.1	1.5, -5.0
	2	8	108.0	108.0	0.0	1.0, -2.5
SEL	200	100	128.0	128.0	0.0	+1.0

10. Peak C loaded level

Number of cycle in sine signal	Anticipated Value (dB)	Measured Value, Leq (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	+1.0
One	135.4	135.3	-0.1	+1.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	+1.0
Positive half cycle	135.4	135.3	-0.1	+1.0
Negative half cycle	135.4	135.3	-0.1	+1.0

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Pages: 8 of 8

11. Overload indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Positive over half cycle	99.6	0.0
Negative over half cycle	99.6	0.0

12. High level stability

Frequency	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	137.0	137.0	0.0	+0.2

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

End of Calibration Certificate

T. Petch...

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Cert. No.: ACL24011
Page: 1 of 8

Calibration Certificate

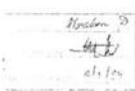
Equipment: SOUND LEVEL METER
Manufacturer: RION
Model: NL-42A / Microphone UC-52 / Pre-amplifier NH-34
Serial No.: 00823389 / 198536 / 72417
ID No.: RYG_175614

Condition As Found: (GOOD)

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

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

Received Date: 19 DECEMBER 2023
Calibration Date: 05-08 JANUARY 2024
Date of Issue: 09 JANUARY 2024



Calibrated by: Natamon Pichaiwan

Approved by: *T. Petch...*
(Thasakul Petchaiwan)

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

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CALIBRATION LABORATORY

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Cert. No.: ACL24011
Job No.: VC67AC0844
Page: 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 meters (SLM).
The SLM had tests to Acoustical and Electrical signal levels of frequency weighting with Acoustic chamber and Reference Standard Instrument.

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

Condition of this result of calibration:

1. Reference Standard Instruments:

Instrument	Model	Serial No.	Cert. No.	Exp. Date
Waveform Generator	33210A	MY-48017076	EF-0029-23	07 FEB 24
Waveform Generator	33511B	MY5332742	EF-0010-23	07 FEB 24
Digital Multimeter	33661A	MY5327044	ELI-BP-30-0256	13 FEB 24
Digital Multimeter	33661A	MY5327076	ELI-BP-29-0256	14 FEB 24
Digital Multimeter	34461A	MY60024273	EEI-BP-31-0256	14 FEB 24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	06 FEB 24
Condenser Microphone	4180	2977900	AA-1001-23	14 FEB 24
Measuring Amplifier	NA-42KAT	14-66095	AA-1003-23	14 FEB 24

2. This result of calibration was based accurate to shown on date and place of calibration for this calibrated item only.

3. This certificate is made by the international system of unit maintained as:

- 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.: ACL24011
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Page: 4 of 8

Result of calibration:

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Noise test

Measured Value (dB)
142

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

Frequency Weighting	Measured value (dB)
A-weight	9.9
C-weight	16.7
Flat	22.5

3. Acoustical signal tests of frequency weightings

Meter linearity accuracy response at a level of 94 dB

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.1	0.1	+1.5
1000	-0.1	-0.1	-0.1	+1.0
3000	1.2	1.3	1.3	+1.0

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Cert. No.: ACL24011
Job No.: VC67AC0844
Page: 5 of 8

4. Electrical signal tests of frequency weightings

Weighting curve response with reference to 1 kHz

Frequency (Hz)	Flat	A-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	+1.5
2000	0.0	0.1	0.0	+2.0
4000	0.0	0.0	0.0	+1.5
8000	0.0	0.1	0.1	+1.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	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
Log	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...

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Cert. No.: ACL24011
Job No.: VC67AC0844
Page: 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	+1.1
136.0	136.0	0.0	+1.1
135.0	135.0	0.0	+1.1
134.0	134.0	0.0	+1.1
133.0	133.0	0.0	+1.1
132.0	132.0	0.0	+1.1
131.0	131.0	0.0	+1.1
129.0	129.0	0.0	+1.1
124.0	124.0	0.0	+1.1
119.0	119.0	0.0	+1.1
114.0	114.0	0.0	+1.1
109.0	109.0	0.0	+1.1
104.0	104.0	0.0	+1.1
99.0	99.0	0.0	+1.1
94.0	94.0	0.0	+1.1
89.0	89.0	0.0	+1.1
84.0	84.0	0.0	+1.1
79.0	79.0	0.0	+1.1
74.0	74.0	0.0	+1.1
69.0	69.0	0.0	+1.1
64.0	64.0	0.0	+1.1
59.0	59.0	0.0	+1.1
54.0	54.0	0.0	+1.1
49.0	49.0	0.0	+1.1
44.0	44.0	0.0	+1.1
39.0	38.9	-0.1	+1.1
34.0	34.0	0.0	+1.1
29.0	28.9	-0.1	+1.1
24.0	23.9	-0.1	+1.1
19.0	18.9	-0.1	+1.1
14.0	13.9	-0.1	+1.1

T. Petch...

SITHIPORN ASSOCIATES CO., LTD. CALIBRATION LABORATORY

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Cert. No.: ACL24031
Job No.: VCG7AC0044
Pages: 7 of 8

16. 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	±1.0

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, -3.0
	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	127.5	127.6	0.1	±1.0
	0.25	1	99.0	99.0	-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-weight level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Leq (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±1.0
One	136.4	136.6	+0.2	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

T. Petchai

SITHIPORN ASSOCIATES CO., LTD. CALIBRATION LABORATORY

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Cert. No.: ACL14033
Job No.: VCG7AC0052
Pages: 7 of 8

Calibration Procedure: CPAC-01

Calibration Method:

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

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

Condition of this result of calibration:

1. Reference Standard Instruments:

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33250A	MY48017076	EP-0009-23	07 FEB-24
Waveform Generator	33511D	MY22302742	EP-0010-23	07 FEB-24
Digital Multimeter	33461A	MY33200104	EEL-BP 290246	13 FEB-24
Digital Multimeter	24461A	MY33200104	EEL-BP 290246	13 FEB-24
Digital Multimeter	34461A	MY60324273	EEL-BP 310366	14 FEB-24
Programmable Amplifier	34AT-1070	62100114	EP-0011-23	08 FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14 FEB-24
Measuring Amplifier	NA-45CAJ	34560495	AA-5002-23	14 FEB-24

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

3. This certificate is transferable to the international system of unit maintained as:

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

T. Petchai

SITHIPORN ASSOCIATES CO., LTD. CALIBRATION LABORATORY

401-402/10th Floor, 10th Floor, Bangkok, 10110 Thailand
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Cert. No.: ACL24031
Job No.: VCG7AC0044
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11. Overload indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limits
Pressing test half cycle	-0.1	±1.5
89.5	89.5	-0.1

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. Petchai

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Cert. No.: ACL24033
Job No.: VCG7AC0052
Pages: 1 of 8

Calibration Certificate

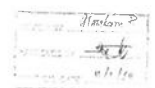
Equipment: SOUND LEVEL METER
Manufacturer: RION
Model: NL-42A / Microphone UC-52 / Pre-amplifier N1-24
Serial No.: 00523392 / 136439 / 26420
ID No.: RYO-F50617

Condition As Found: GOOD

Customer: A.S.L. LABORATORY GROUP (THAILAND) CO., LTD.
161 WIATTHANAKAN 46, WIATTHANAKAN ROAD,
KHUANG PHATTHANAKAN, KHUANG PHATTHANAKAN,
BANGKOK, 10250 THAILAND

Location: + (23.0 ± 3.0) °C
Ambient Temperature: (10.0 ± 3.0) °C
Pressure: (1013.0 ± 3.0) hPa
Relative Humidity: (50.0 ± 2.0) %

Received Date: 05 JANUARY 2024
Calibration Date: 15 JANUARY 2024
Date of Issue: 16 JANUARY 2024



Calibrated by: Nithakorn Petchai

Approved by: T. Petchai
(Thanakorn Petchai)

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Cert. No.: ACL14033
Job No.: VCG7AC0052
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Result of calibration:

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
93.9 (93.58)	93.9	0.0	±0.3

2. Self-generated noise

Measured Value (dB)
14.8

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

Frequency Weighting	Measured value (dB)
A-weight	13.8
C-weight	20.6
Flat	26.1

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits (dB)
125	0.3	0.1	0.1	±1.5
1000	0.0	0.0	0.0	±1.0
8000	1.2	1.3	1.3	±5.0

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Cert. No.: ACL24033
Job No.: VCG7AC0052
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4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits (dB)
63	0.0	0.0	0.0	±2.0
125	0.0	0.1	0.1	±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

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

7.2 Time weighting at 1 kHz

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

6. Long-term stability

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

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Cert. No.: ACL24033
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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
128.0	128.0	0.0	±1.1
127.0	127.0	0.0	±1.1
126.0	126.0	0.0	±1.1
125.0	125.0	0.0	±1.1
124.0	124.0	0.0	±1.1
123.0	123.0	0.0	±1.1
122.0	122.0	0.0	±1.1
121.0	121.0	0.0	±1.1
120.0	120.0	0.0	±1.1
119.0	119.0	0.0	±1.1
118.0	118.0	0.0	±1.1
117.0	117.0	0.0	±1.1
116.0	116.0	0.0	±1.1
115.0	115.0	0.0	±1.1
114.0	114.0	0.0	±1.1
113.0	113.0	0.0	±1.1
112.0	112.0	0.0	±1.1
111.0	111.0	0.0	±1.1
110.0	110.0	0.0	±1.1
109.0	109.0	0.0	±1.1
108.0	108.0	0.0	±1.1
107.0	107.0	0.0	±1.1
106.0	106.0	0.0	±1.1
105.0	105.0	0.0	±1.1
104.0	104.0	0.0	±1.1
103.0	103.0	0.0	±1.1
102.0	102.0	0.0	±1.1
101.0	101.0	0.0	±1.1
100.0	100.0	0.0	±1.1
99.0	99.0	0.0	±1.1
98.0	98.0	0.0	±1.1
97.0	97.0	0.0	±1.1
96.0	96.0	0.0	±1.1
95.0	95.0	0.0	±1.1
94.0	94.0	0.0	±1.1
93.0	93.0	0.0	±1.1
92.0	92.0	0.0	±1.1
91.0	91.0	0.0	±1.1
90.0	90.0	0.0	±1.1
89.0	89.0	0.0	±1.1
88.0	88.0	0.0	±1.1
87.0	87.0	0.0	±1.1
86.0	86.0	0.0	±1.1
85.0	85.0	0.0	±1.1
84.0	84.0	0.0	±1.1
83.0	83.0	0.0	±1.1
82.0	82.0	0.0	±1.1
81.0	81.0	0.0	±1.1
80.0	80.0	0.0	±1.1
79.0	79.0	0.0	±1.1
78.0	78.0	0.0	±1.1
77.0	77.0	0.0	±1.1
76.0	76.0	0.0	±1.1
75.0	75.0	0.0	±1.1

T. Petchai

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Cert. No.: ACL24033
Job No.: VCG7AC0052
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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	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	127.5	127.6	0.1	±1.0
	0.25	1	99.0	99.0	-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-weight level

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

Cert. No.: A/CCL23262
Job No.: VC66AC0094
Page: 8 of 8Cert. No.: A/CCL23262
Job No.: VC66AC0094
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Calibration Certificate

Equipment: SOUND LEVEL METER
Manufacturer: RION
Model: NL-42 Microphone UC-52 / Pre-amplifier NH-24
Serial No.: 00572561 / 170148 / 72889
ID No.: RYG, J80309

Condition As Found: 60003

Customer: ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATHANAKAN 60, PHATHANAKAN ROAD,
KHUANG KHUANG PHATHANAKAN, KHUANG KHUANG
BANGKOK, 10250 THAILAND

Location: -
Ambient Temperature: (23.0 ± 1) °C
Pressure: (101.3 ± 1) kPa
Relative Humidity: (50.0 ± 20) %
Received Date: 23 AUGUST 2021
Calibration Date: 01 SEPTEMBER 2021
Date of Issue: 04 SEPTEMBER 2021

Calibrated by: Natchanon Panyasri

Approved by:

T. Petch
(Thanakorn Petchum)

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QP-TN-214-04-02-004

Cert. No.: A/CCL23262
Job No.: VC66AC0094
Page: 2 of 8

Calibration Procedure: CP-AC-01

Calibration Method:

This equipment was calibrated by hand on IEC 61672-2 (2013) Standard for sound level meter (SLM).

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

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

Condition of this result of calibration:

1. Reference Standard Instruments:

Instrument	Model	Serial No.	Cal. Due	Exp. Date
Wavem Generator	3320A	NY40017076	E1-0809-23	07-01-24
Wavem Generator	3351D	NY52302742	E1-0809-23	07-01-24
Digital Multimeter	34461A	NY53201104	EELIP-10-2024	12-01-24
Digital Multimeter	34461A	NY53201076	EELIP-10-2024	12-01-24
Digital Multimeter	34461A	NY53201273	EELIP-10-2024	12-01-24
Programmable Attenuator	MAF-1070	62100114	E1-0801-23	08-01-24
Condenser Microphone	4180	2977600	AA-1001-23	10-01-24
Measuring Amplifier	NA-420A1	34560193	AA-1002-23	10-01-24

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 suitable as the international system of unit measurement as:

3.1 National Institute of Standards (NIST).

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

QP-TN-214-04-02-004

T. Petch
(Thanakorn Petchum)

Cert. No.: A/CCL23262
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Summary of Measurement Result:

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings	✓	-	0.3	0.6
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings	✓	-	0.3	0.6
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For > 4 kHz to 10 kHz	✓	-	0.3	0.7
For > 10 kHz to 20 kHz	-	-	-	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long-term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Time burst response	✓	-	0.2	0.3
10. Peak C-weight 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 limits and the Maximum-permitted uncertainty of measurement.

QP-TN-214-04-02-004

T. Petch
(Thanakorn Petchum)

Cert. No.: A/CCL23262
Job No.: VC66AC0094
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Result of Calibration:

1. Absolute sensitivity

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

2. Self-generated noise

Measured Value (dB)
16.1

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

Frequency Weighting	Measured Value (dB)
A-weight	12.9
C-weight	18.2
Flat	24.0

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)
	Flat C-weight A-weight Acceptance Limits
125	0.2 0.2 0.2 ±1.5
1000	-0.1 -0.1 -0.1 ±1.0
2000	0.3 0.4 0.4 ±1.0

QP-TN-214-04-02-004

T. Petch
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Cert. No.: A/CCL23262
Job No.: VC66AC0094
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4. Electrical signal tests of frequency weightings

Weighting network response with reference to 1 kHz

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

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviation 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 weightings at 1 kHz

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

6. Long-term stability

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

QP-TN-214-04-02-004

T. Petch
(Thanakorn Petchum)

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Job No.: VC66AC0094
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7. Level linearity on the reference level range

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

QP-TN-214-04-02-004

T. Petch
(Thanakorn Petchum)

Cert. No.: A/CCL23262
Job No.: VC66AC0094
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8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Time burst response

Time	Time burst duration, T _B (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	100.0	100.0	0.0	±1.5
	2	8	117.0	117.0	0.0	±1.5
	200	800	134.0	134.0	0.0	±1.5
Slow	2	8	100.0	100.0	0.0	±1.5
	200	800	127.0	127.0	0.0	±1.5
	0.25	1	90.0	90.0	0.0	±1.5
	2	8	100.0	100.0	0.0	±1.5
	200	800	120.0	120.0	0.0	±1.5

10. Peak C-weight level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Typical (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Continuous	135.0	135.0	0.0	±1.0
One	136.4	136.4	0.0	±1.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Continuous	135.0	135.0	0.0	±1.0
Positive half cycle	135.4	135.4	0.0	±1.0
Negative half cycle	135.4	135.4	0.0	±1.0

QP-TN-214-04-02-004

T. Petch
(Thanakorn Petchum)

Cert. No.: A/CCL23262
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Page: 8 of 8

11. Overload indication

Measured value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	94.0	±1.5
Negative one-half cycle	94.0	±1.5

12. High level stability

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

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

End of Calibration Certificate

QP-TN-214-04-02-004

T. Petch
(Thanakorn Petchum)

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

451-4511 Sithiporn Rd, Bangpattana, Bangkok 10700 THAILAND
Tel: 0-2415-8020 Fax: 0-2415-1619 e-mail: cal@calibrationlab.com http://www.calibrationlab.com



Cert. No.: ACL23248
Job No.: YC66AC0085
Pages: 1 of 8

Calibration Certificate

Equipment: SOUND LEVEL METER
Manufacturer: RION
Model: NL-42 Microphone UC-32 / Pre-amplifier NH-24
Serial No.: 00472132 / 16914 / 72464
ID No.: RYG-190301

Condition As Found: GOOD

Customer: ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHA THIANAKAN RD, PHA THIANAKAN ROAD,
KHWAENG PHA THIANAKAN, KHEE SUAN LUANG,
BANGKOK, 10250 THAILAND

Location: -
Ambient Temperature: (23.0 ± 3) °C
Pressure: (101.3 ± 0.3) kPa
Relative Humidity: (50.0 ± 2.0) %

Received Date: 13 JULY 2023
Calibration Date: 10 AUGUST 2023
Date of Issue: 11 AUGUST 2023

Calibrated by: Natchanon Petchumai

Approved by: T. Petchumai
(Thanakul Petchumai)

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other than in full, except with the prior written approval of the head of Calibration Laboratory.

QP-TS-24-04-04-0004

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No.: ACL23248
Job No.: YC66AC0085
Pages: 2 of 8

Calibration Procedure: CP-AC-01

Calibration Method:

The equipment was calibrated by based on IEC 61672-3:2013 Standard for sound level meter (SLM).
The SLM had tests Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference
Standard Instruments.
For test results of each items were made by observation of each instrument's display and also with SLM's display.

Condition of this result of calibration:

1. Reference Standard Instruments:

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY46317676	13-0809-23	07-11-24
Waveform Generator	33511B	MY52302742	13-0809-23	07-11-24
Digital Multimeter	33461A	MY53220064	13-10-23	03-01-24
Digital Multimeter	33461A	MY53220064	13-10-23	03-01-24
Digital Multimeter	34461A	MY60025273	13-10-23	03-01-24
Impedance Admittance	3384-1070	82100114	13-0809-23	08-01-24
Condenser Microphone	4188	2977960	AA-0809-23	14-10-24
Microphone Amplifier	NA-CKAI	34560495	AA-0809-23	14-10-24

2. The result of calibration was found accurate as shown on date and place of calibration for this calibration item only.

3. This certificate is transferable to the international system of units maintained at:

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

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No.: ACL23248
Job No.: YC66AC0085
Pages: 3 of 8

Summary of Measurement Result:

Parameter	Pass	Fail	Uncertainty (dB)	Maximum permitted uncertainty (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings	✓	-	0.2	N/A
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.6
4. Electrical signal tests of frequency weightings	✓	-	0.3	0.6
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For 4 kHz to 10 kHz	✓	-	0.3	0.6
For 10 kHz to 20 kHz	-	-	-	1.0
5. Frequency and time stability	✓	-	0.2	0.2
6. Level linearity on the reference level range	✓	-	0.1	0.3
7. Level linearity including the level range control	✓	-	0.2	0.3
8. Time burst response	✓	-	0.2	0.3
9. 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 with the acceptance limit and the Maximum permitted uncertainty of measurement.

QP-TS-24-04-04-0004

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No.: ACL23248
Job No.: YC66AC0085
Pages: 4 of 8

Result of calibration:

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.58)	93.9	0.0	±0.3

2. Self-generated noise

2.1. Noise test

Measured Value (dB)
14.4

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

Frequency Weighting (dB)	Measured value (dB)
A-weight	12.6
C-weight	17.8
Flat	23.2

3. Acoustical signal tests of frequency weightings

3.1. Flat field, field acoustic response at a level of 94 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limit
125	0.7	0.7	0.7	± 1.5
1000	-0.1	0.0	0.0	± 1.0
8000	-4.1	-4.0	-4.1	± 5.0

QP-TS-24-04-04-0004

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No.: ACL23248
Job No.: YC66AC0085
Pages: 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with reference to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limit (dB)
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	±3.5
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 Limit (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 Limit (dB)
Fast	94.0	94.0	0.0	±0.1
Slow	94.0	94.0	0.0	±0.1
Imp	94.0	94.0	0.0	±0.1

6. Long-term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limit (dB)
A-weight	94.0	94.0	0.0	±0.1

QP-TS-24-04-04-0004

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No.: ACL23248
Job No.: YC66AC0085
Pages: 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (dB)
137.0	137.0	0.0	±1.1
136.0	136.0	0.0	±1.1
135.0	135.0	0.0	±1.1
134.0	134.0	0.0	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.0	0.0	±1.1
114.0	114.0	0.0	±1.1
109.0	109.0	0.0	±1.1
104.0	104.0	0.0	±1.1
99.0	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	63.9	-0.1	±1.1
59.0	59.0	0.0	±1.1
54.0	53.9	-0.1	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
29.0	29.0	0.0	±1.1
24.0	24.0	0.0	±1.1
19.0	19.0	0.0	±1.1
14.0	14.0	0.0	±1.1
9.0	9.0	0.0	±1.1

QP-TS-24-04-04-0004

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No.: ACL23248
Job No.: YC66AC0085
Pages: 8 of 8

11. Overload indication

Measured value (dB)		Deviated	Acceptance
Positive	Negative	Value	Limit
one-half cycle	one-half cycle	(dB)	(dB)
10.7	10.7	0.0	±1.5

12. High level stability

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

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

End of Calibration Certificate

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

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Cert. No.: ACL23248
Job No.: YC66AC0085
Pages: 1 of 8

Calibration Certificate

Equipment: SOUND LEVEL METER
Manufacturer: RION
Model: NL-42 Microphone UC-32 / Pre-amplifier NH-24
Serial No.: 00472132 / 16914 / 72464
ID No.: RYG-190301

Condition As Found: GOOD

Customer: ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHA THIANAKAN RD, PHA THIANAKAN ROAD,
KHWAENG PHA THIANAKAN, KHEE SUAN LUANG,
BANGKOK, 10250 THAILAND

Location: -
Ambient Temperature: (23.0 ± 3) °C
Pressure: (101.3 ± 0.3) kPa
Relative Humidity: (50.0 ± 2.0) %

Received Date: 23 AUGUST 2023
Calibration Date: 01 SEPTEMBER 2023
Date of Issue: 04 SEPTEMBER 2023

Calibrated by: Natchanon Petchumai

Approved by: T. Petchumai
(Thanakul Petchumai)

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other than in full, except with the prior written approval of the head of Calibration Laboratory.

QP-TS-24-04-04-0004

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No.: ACL23248
Job No.: YC66AC0085
Pages: 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (dB)
Auto	94.0	94.0	0.0	±1.1

9. Time burst response

Time Weighting	Time burst duration, T _b (sec)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (dB)
Fast	0.25	1	108.0	107.9	-0.1	±2.5 ± 0.0
	2	8	117.0	117.0	0.0	±1.0 ± 0.0
	200	800	134.0	134.0	0.0	±1.0 ± 0.0
Slow	2	8	108.0	108.0	0.0	±2.5 ± 0.0
	200	800	127.0	127.0	0.0	±1.0 ± 0.0
	0.25	1	99.0	99.0	-0.1	±2.5 ± 0.0
SLI	2	8	108.0	108.0	0.0	±1.0 ± 0.0
	200	800	128.0	128.1	0.1	±1.0 ± 0.0

10. Peak C sound level

Number of cycle in test signal (dB)	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (dB)
Continuous	133.0	133.0	0.0	±1.0
Out	136.4	135.6	-0.8	±3.0

Number of cycle in test signal (dB)	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (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

QP-TS-24-04-04-0004

Continuation of Calibration Certificate

Cert. No. : ACL23261
Job No. : VC66AC0094
Pages : 3 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment is calibrated by based on IEC-61672-2 (2013) Standard for sound level meter (SLM).

The SLM had been tested Acoustic and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instruments.

For test results of each item were made by observation of each 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	MY48017976	17-0608-23	07-FEB-24
Waveform Generator	33511B	MY52302742	17-0608-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	ELL-IP 3040266	13-FEB-24
Digital Multimeter	33461A	MY53220676	ELL-IP 290266	13-FEB-24
Digital Multimeter	33461A	MY60024273	ELL-IP 160266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	17-0608-23	08-FEB-24
Condenser Microphone	4180	2977060	AA-1002-23	14-FEB-24
Measuring Amplifier	NA-42KAI	3450495	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 :

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

Continuation of Calibration Certificate

Cert. No. : ACL23261
Job No. : VC66AC0094
Pages : 3 of 8

Summary of Measurement Results :

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-weight 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.

Continuation of Calibration Certificate

Cert. No. : ACL23261
Job No. : VC66AC0094
Pages : 4 of 8

Result of Calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.8)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal tone

Measured Value (dB)
18.0

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	15.9
Flat	21.8

3. Acoustical signal tests of frequency weightings

Meter line full-scale response at a level of 94 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	± 1.5
1000	-0.1	-0.1	-0.1	± 1.0
8000	-1.4	-1.5	-1.5	±0.0

Continuation of Calibration Certificate

Cert. No. : ACL23261
Job No. : VC66AC0094
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	±2.5
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	±0.6
2000	0.0	0.1	0.1	±2.0
4000	0.0	0.1	0.1	±3.0
8000	0.1	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long-term stability

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

Continuation of Calibration Certificate

Cert. No. : ACL23261
Job No. : VC66AC0094
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)
A-weight	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Th (sec)	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/-0.5
	2	8	117.0	116.9	-0.1	1.5/-0.5
	200	800	134.0	134.6	0.6	±0.0
Slow	0.25	1	108.0	107.9	-0.1	1.5/-0.5
	2	8	108.0	107.9	-0.1	1.5/-0.5
	200	800	127.5	127.6	0.1	±0.0
SLI	0.25	1	99.0	99.3	0.3	1.5/-0.5
	2	8	108.0	108.0	0.0	1.0/-0.5
	200	800	128.0	128.0	0.0	±0.0

10. Peak C-weight level

Number of cycle	Anticipated Value (dB)	Measured Value, Legible (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	135.0	135.0	0.0	±0.0
One	136.4	135.5	-0.9	±0.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	135.0	135.0	0.0	±0.0
Positive half cycle	135.4	135.1	-0.3	±0.0
Negative half cycle	135.4	135.1	-0.3	±0.0

Continuation of Calibration Certificate

Cert. No. : ACL23261
Job No. : VC66AC0094
Pages : 8 of 8

11. Overload indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limits
Positive one-half cycle	139.5	±1.5
Negative one-half cycle	139.6	±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

631-45119 Srinakharinwirot Rd., Bangchuan, Bangkok 10710 THAILAND.
Tel: 02-2415-8820 Fax: 02-2413-1679 e-mail: cal-center@sithiporn.com http://www.sithiporn.comCert. No. : ACL23261
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 Microphone UC-52 / Preamp/er S11-24
Serial No. : 00873057 / 171591 / 73333
ID No. : RYG, FS2051

Condition As Fused :

GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHU KUTIANAKAN RD, PHATTHANAKAN ROAD,
KIWAENG PHATTHANAKAN, KUT SUAN LUANG,
BANGKOK, 10250 THAILAND

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) hPa
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 Pichapaisan

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

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Continuation of Calibration Certificate

Cert. No. : ACL23261
Job No. : VC67AC0011
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC-61672-2 (2013) Standard for sound level meter (SLM).

The SLM had been tested Acoustic and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instruments.

For test results of each item were made by observation of each 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	MY48017976	17-0608-23	07-FEB-24
Waveform Generator	33511B	MY52302742	CF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	ELL-IP 3040266	13-FEB-24
Digital Multimeter	33461A	MY53220676	ELL-IP 290266	13-FEB-24
Digital Multimeter	33461A	MY60024273	ELL-IP 160266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	17-0608-23	08-FEB-24
Condenser Microphone	4180	2977060	AA-1002-23	14-FEB-24
Measuring Amplifier	NA-42KAI	3450495	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 :

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

Continuation of Calibration Certificate

Cert. No. : ACL23261
Job No. : VC67AC0011
Pages : 3 of 8

Summary of Measurement Results :

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-weight 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.

Continuation of Calibration Certificate

Cert. No. : ACL3333
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 (93.5)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.8

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

Frequency Weighting (dB)	Measured value (dB)
A-weight	12.0
C-weight	18.2
Flat	24.0

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	±1.5
1000	0.0	0.0	0.0	±1.0
8000	0.5	0.6	0.6	±1.0

QT-TS12-04-04-02-06-04

T. Pich

Continuation of Calibration Certificate

Cert. No. : ACL3333
Job No. : VC67AC0011
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighted network response with relative 1:1 ratio

Frequency (Hz)	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	±3.0

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
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 weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits
Fast	94.0	94.0	0.0	±0.1
Slow	94.0	94.0	0.0	±0.1
Log	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
A-weight	94.0	94.0	0.0	±0.3

QT-TS12-04-04-02-06-04

T. Pich

Continuation of Calibration Certificate

Cert. No. : ACL3333
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
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
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
	250	800	134.0	134.0	0.0	±1.0
Slow	2	8	105.0	108.0	0.0	1.5 ± 5.0
	200	500	127.6	127.5	-0.1	±1.0
	0.25	1	96.0	96.9	+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-weight level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Leq _{pk} (dB)	Deviated Value (dB)	Acceptance Limits
Continuous	133.0	133.0	0.0	±1.0
One	136.4	136.2	-0.2	±1.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	133.4	133.2	-0.2	±2.0
Negative half cycle	133.4	133.2	-0.2	±2.0

QT-TS12-04-04-02-06-04

T. Pich

Continuation of Calibration Certificate

Cert. No. : ACL3333
Job No. : VC67AC0011
Pages : 8 of 8

11. Overload indication

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

12. High level stability

Frequency Weighting	SLM Display at level (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits
A-weight	127.0	127.0	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

QT-TS12-04-04-02-06-04

T. Pich

Continuation of Calibration Certificate

Cert. No. : ACL3334
Job No. : VC67AC0011
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC 61672-2 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weightings with A-weight chamber and Reference
Standard Instruments.

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

Conditions of this result of calibration :

1. Reference Standard Instruments

Instrument	Model	Serial No.	Cert. No.	Due Date
Wayfoner Generator	33510A	NY45617076	EF-0009-23	07 FEB 24
Wayfoner Generator	33511B	NY5202742	TF-0010-23	07 FEB 24
Digital Multimeter	34461A	MY53220104	EEL-BP 30/0256	13 FEB 24
Digital Multimeter	34461A	MY53220776	EEL-BP 39/0256	13 FEB 24
Digital Multimeter	34461A	MY66024273	EEL-BP 31/0256	14 FEB 24
Programmable Attenuator	MAT-1070	63100114	EF-0011-23	08 FEB 24
Condenser Microphone	4180	7975000	AA-1001-23	14 FEB 24
Measuring Amplifier	NA-42KA	34560493	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 applicable to the international system of units mentioned at :

3.1 National Institute of Metrology (Thailand)

3.2 Thailand Institute of Scientific and Technological Research (TISTR)

Continuation of Calibration Certificate

Cert. No. : ACL3334
Job No. : VC67AC0011
Pages : 3 of 8

Summary of Measurement Results

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings	✓	-	0.3	0.6
For 10 Hz to 4 kHz	✓	-	0.3	0.7
For 4 kHz to 10 kHz	✓	-	0.3	0.7
For 10 kHz to 20 kHz	-	-	-	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long-term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Tone burst response	✓	-	0.2	0.3
10. Peak C-weight level	✓	-	0.2	0.3
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

Note : Pass/Fail evaluation for each parameter
will be concluded together from the acceptance limit and the Maximum-permitted uncertainty of measurement.

QT-TS12-04-04-02-06-04

T. Pich

Continuation of Calibration Certificate

Cert. No. : ACL3334
Job No. : VC67AC0011
Pages : 4 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	44.0	0.0	±1.1
39.0	38.9	-0.1	±1.1
34.0	33.9	-0.1	±1.1
29.0	29.9	+0.1	±1.1
24.0	24.9	+0.1	±1.1
19.0	19.9	+0.1	±1.1
14.0	14.9	+0.1	±1.1
9.0	9.9	+0.1	±1.1
4.0	4.9	+0.1	±1.1

QT-TS12-04-04-02-06-04

T. Pich

451-451/1 Sukhum 56, Bangkok, Bangkok 10700 THAILAND
Tel: 02-2546070 Fax: 02-2546109 E-mail: cal-center@thai-hp.com B2P: www.sithiporn.comCert. No. : ACL3334
Job No. : VC67AC0011
Pages : 1 of 8

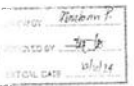
Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : ML-42 Microphone UC-52 / Pre-amplifier NH-24
Serial No : 0087109 / 171842 / 73485
ID No : RYG_F50164

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD
104 PHATTANAKAN 42, PHATTANAKAN ROAD,
KHWAENG PHATTANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : (23.0 ± 3.3) °C
Ambient Temperature : (100.1 ± 3.3) kPa
Pressure : (50.0 ± 2.0) %
Relative Humidity :
Received Date : 11 OCTOBER 2023
Calibration Date : 19-20 OCTOBER 2023
Date of Issue : 24 OCTOBER 2023



Calibrated by : Nattakorn Pichpruek

Approved by : T. Pich
(Thakorn Pichpruek)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.

QT-TS12-04-04-02-06-04

Continuation of Calibration Certificate

Cert. No. : ACL3334
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 (93.5)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.8

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

Frequency Weighting (dB)	Measured value (dB)
A-weight	11.3
C-weight	17.5
Flat	23.1

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.4	0.4	0.3	±1.3
1000	0.0	0.0	0.0	±1.0
8000	-1.2	-1.1	-1.1	±1.0

QT-TS12-04-04-02-06-04

T. Pich

Continuation of Calibration Certificate

Cert. No. : ACL23324
Job No. : YC67AC0011
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

QP-TS12-04-04-02004

T. P. P. P.

Continuation of Calibration Certificate

Cert. No. : ACL23324
Job No. : YC67AC0011
Pages : 5 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	±1.3
135.0	135.0	0.0	±1.3
133.0	133.0	0.0	±1.3
131.0	131.0	0.0	±1.3
129.0	129.0	0.0	±1.3
127.0	127.0	0.0	±1.3
125.0	125.0	0.0	±1.3
119.0	119.0	0.0	±1.3
114.0	114.0	0.0	±1.3
109.0	109.0	0.0	±1.3
104.0	104.0	0.0	±1.3
99.0	99.0	0.0	±1.3
94.0	94.0	0.0	±1.3
89.0	89.0	0.0	±1.3
84.0	84.0	0.0	±1.3
79.0	79.0	0.0	±1.3
74.0	74.0	0.0	±1.3
69.0	69.0	0.0	±1.3
64.0	64.0	0.0	±1.3
59.0	59.0	0.0	±1.3
54.0	54.0	0.0	±1.3
49.0	49.0	0.0	±1.3
44.0	44.0	-0.1	±1.3
39.0	39.0	-0.1	±1.3
34.0	34.0	0.0	±1.3
29.0	29.0	-0.1	±1.3
24.0	24.0	-0.1	±1.3
19.0	19.0	-0.1	±1.3
14.0	14.0	-0.1	±1.3
9.0	9.0	-0.1	±1.3

QP-TS12-04-04-02004

T. P. P. P.

Continuation of Calibration Certificate

Cert. No. : ACL23324
Job No. : YC67AC0011
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, T _b (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	106.0	107.0	-0.1	1.5 : -0.6
	2	8	117.0	117.0	0.0	1.0 : -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	0.25	1	99.0	99.0	-0.1	1.5 : -0.6
	2	8	106.0	106.0	0.0	1.0 : -2.5
	200	800	126.0	126.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	135.4	135.4	-0.6	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	132.0	132.0	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

QP-TS12-04-04-02004

T. P. P. P.

Continuation of Calibration Certificate

Cert. No. : ACL23325
Job No. : YC67AC0011
Pages : 1 of 1

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

QP-TS12-04-04-02004

T. P. P. P.

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY831-8313 Siphorn Rd, Jang Thani, Bangor 10100 THAILAND
Tel: 02-245-8800 Fax: 02-245-8809 Email: info@sithiporn.com Web: www.sithiporn.comCert. No. : ACL23325
Job No. : YC67AC0011
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : ML-42 Microphone UC-52 / Pre-amplifier NH-24
Serial No. : 01073423 / 169513 / 75844
ID No. : RYG, PS0366

Condition As Found : GOOD

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

Location :
Ambient Temperature : (23.0 ± 0.3) °C
Pressure : (101.3 ± 0.1) kPa
Relative Humidity : (50.0 ± 20.0) %

Received Date : 11 OCTOBER 2023
Calibration Date : 19-20 OCTOBER 2023
Date of Issue : 24 OCTOBER 2023

Calibrated by : Natchanon Pongpattana

Approved by : T. P. P. P.
(Technical Director)

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

QP-TS12-04-04-02004

Continuation of Calibration Certificate

Cert. No. : ACL23325
Job No. : YC67AC0011
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by standard by IEC 61672-3 (2013) Standard for sound level meter (SLM).
The SLM had been in Acoustic and Electrical signal tests of frequency weighting with Acoustic chamber and Reference
Standard Instruments.
For tests results of each item were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	IF-0009-23	07-FEB-24
Waveform Generator	33511B	MY32302742	IF-0010-23	07-FEB-24
Digital Multimeter	34461A	MY33220104	EEL-BP 300264	13-FEB-24
Digital Multimeter	34461A	MY33220476	EEL-BP 300264	14-FEB-24
Digital Multimeter	34461A	MY33220473	EEL-BP 300264	08-FEB-24
Programmable Auto user	MAT-1070	63100114	IF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42CA	34504955	AA-2002-21	14-FEB-24

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

3. This certificate is traceable to the international system of unit as indicated as:

- 1) National Institute of Metrology (Thailand).
- 2) National Institute of Standards and Technology (NIST).

QP-TS12-04-04-02004

T. P. P. P.

Continuation of Calibration Certificate

Cert. No. : ACL23325
Job No. : YC67AC0011
Pages : 3 of 8

Summary of Measurement Results :

Parameter	Pass	Fail	Uncertainty	Maximum-permitted uncertainty of measurement (dB)
1. Absolute accuracy	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings	✓	-	0.3	0.6
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings	✓	-	0.3	0.6
For 10 Hz to 4 kHz	✓	-	0.3	0.6
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. Time burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.3
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

Note : Pass/Fail evaluation for each parameter,
will be considered together from the acceptance limit and the Maximum permitted uncertainty of measurement.

QP-TS12-04-04-02004

T. P. P. P.

Continuation of Calibration Certificate

Cert. No. : ACL23325
Job No. : YC67AC0011
Pages : 4 of 8

Result of Calibration :

1. Absolute accuracy

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limits (dB)
93.9 (93.8)	93.9	0.0	±0.3

2. Self-generated noise

Measured Value (dB)
15.4

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

Frequency Weighting	Measured value (dB)
A-weight	13.1
C-weight	19.3
Flat	24.6

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.2	0.2	0.2	±1.5
1000	0.0	0.0	0.0	±1.0
8000	1.6	1.7	1.6	±3.0

QP-TS12-04-04-02004

T. P. P. P.

Continuation of Calibration Certificate

Cert. No. : ACL23325
Job No. : YC67AC0011
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

QP-TS12-04-04-02004

T. P. P. P.

5. Level linearity on the reference level range

Assigned Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	+1.3
136.0	136.0	0.0	+1.3
135.0	135.0	0.0	+1.3
134.0	134.0	0.0	+1.3
133.0	133.0	0.0	+1.3
132.0	132.0	0.0	+1.3
131.0	131.0	0.0	+1.3
129.0	129.0	0.0	+1.3
124.0	124.0	0.0	+1.3
119.0	119.0	0.0	+1.3
114.0	114.0	0.0	+1.3
109.0	109.0	0.0	+1.3
104.0	104.0	0.0	+1.3
99.0	99.0	0.0	+1.3
94.0	94.0	0.0	+1.3
89.0	89.0	0.0	+1.3
84.0	84.0	0.0	+1.3
79.0	79.0	0.0	+1.3
74.0	74.0	0.0	+1.3
69.0	69.0	0.0	+1.3
64.0	64.0	0.0	+1.3
59.0	59.0	0.0	+1.3
54.0	53.9	-0.1	+1.3
49.0	49.0	0.0	+1.3
44.0	43.9	-0.1	+1.3
39.0	38.9	-0.1	+1.3
34.0	33.9	-0.1	+1.3
29.0	28.9	-0.1	+1.3
24.0	23.9	-0.1	+1.3
19.0	18.9	-0.1	+1.3
14.0	13.9	-0.1	+1.3
9.0	8.9	-0.1	+1.3
4.0	3.9	-0.1	+1.3

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8. Level linearity including the level range control

Range	Assigned Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	+1.3

9. Time burst response

Time Weighting	Time burst duration, T _b (ms)	Cycle	Assigned 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
SPL	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	Assigned Value (dB)	Measured Value (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	Assigned Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	135.4	135.2	-0.2	+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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11. Overload indication

Measured value (dB)	Assigned Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Positive one half cycle	89.0	89.0	+1.3

12. High level stability

Frequency Weighting	SLM Display at final (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	137.9	137.0	0.0	+0.3

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

End of Calibration Certificate

Q1-1932-04-04-02004

T. P. P.

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-62 / Pre-amplifier NH-24
Serial No. : 01173609 / 172170 / 78021
ID No. : RYG J50188

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTANAKAN 46, PHATTANAKAN ROAD,
KHUANG PHATTANAKAN, KHUAT SUAN LUANG,
BANGKOK, 10150 THAILAND.

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

Recd. Date : 19 DECEMBER 2023
Calibration Date : 05-08 JANUARY 2024
Date of Issue : 09 JANUARY 2024

Calibrated by : Natchanon Pansripan

Approved by : T. P. P.
(Thanakul Petchai)

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

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	0.0	+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

Frequency Weighting	Assigned 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

5.1 Time weighting at 1 kHz

Frequency Weighting	Assigned 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
Long	94.0	94.0	0.0	+0.1

6. Long-term stability

Frequency Weighting	SLM Display at final (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.0	0.0	+0.3

7. Level linearity on the reference level range

Assigned Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	+1.3
136.0	136.0	0.0	+1.3
135.0	135.0	0.0	+1.3
134.0	134.0	0.0	+1.3
133.0	133.0	0.0	+1.3
132.0	132.0	0.0	+1.3
131.0	131.0	0.0	+1.3
129.0	129.0	0.0	+1.3
124.0	124.0	0.0	+1.3
119.0	119.0	0.0	+1.3
114.0	114.0	0.0	+1.3
109.0	109.0	0.0	+1.3
104.0	104.0	0.0	+1.3
99.0	99.0	0.0	+1.3
94.0	94.0	0.0	+1.3
89.0	89.0	0.0	+1.3
84.0	84.0	0.0	+1.3
79.0	79.0	0.0	+1.3
74.0	74.0	0.0	+1.3
69.0	69.0	0.0	+1.3
64.0	64.0	0.0	+1.3
59.0	59.0	0.0	+1.3
54.0	54.0	0.0	+1.3
49.0	49.0	0.0	+1.3
44.0	44.0	0.0	+1.3
39.0	39.0	0.0	+1.3
34.0	34.0	0.0	+1.3
29.0	29.0	0.0	+1.3
24.0	24.0	0.0	+1.3
19.0	19.0	0.0	+1.3
14.0	14.0	0.0	+1.3
9.0	9.0	0.0	+1.3

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T. P. P.

Cert. No. : ACL24007
Job No. : VC67AC0044
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8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (dB)
Audio	94.0	94.0	0.0	+1.1

9. Tone burst response

Time	Tone burst duration, T _b (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (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	100	134.0	134.0	0.0	+1.0
Slow	2	8	108.0	108.0	0.0	1.5, -5.0
	200	100	137.6	137.6	0.0	+1.0
	0.25	1	99.0	99.9	+0.1	1.5, -5.0
SEL	2	8	108.0	108.0	0.0	1.0, -2.5
	200	100	128.0	128.0	0.0	+1.0

10. Peak C sound level

Number of cycle in signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limit (dB)
Continuous	133.0	133.0	0.0	+2.0
One	136.4	136.3	-0.1	+2.0

Number of cycle in signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (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. Petch

SITHIPORN ASSOCIATES CO., LTD. CALIBRATION LABORATORY

Cert. No. : ACL34008
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 been to Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference Standard Instrument.

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

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Exp. Date
Waveform Generator	3320A	MY48017676	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY53207452	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	IEEL-HP 2040264	13-FEB-24
Digital Multimeter	33461A	MY53220076	IEEL-HP 2040266	13-FEB-24
Digital Multimeter	34461A	MY6024273	IEEL-HP 3140266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	06-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-2KAI	34160405	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 transferable to the international system of unit maintained at :

- National Institute of Metrology (Thailand),
- Thailand Institute of Science and Technological Research (TISTR),

T. Petch

SITHIPORN ASSOCIATES CO., LTD. CALIBRATION LABORATORY

Cert. No. : ACL24008
Job No. : VC67AC0044
Pages : 3 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance
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	+2.0
2000	0.0	0.0	0.0	+1.0
4000	0.0	0.0	0.0	+1.0
8000	0.0	0.1	0.1	+1.0

5. Frequency and time weightings at 1 kHz

Frequency weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (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 Limit (dB)
Fast	94.0	94.0	0.0	+0.1
Slow	94.0	94.0	0.0	+0.1
Imp	94.0	94.0	0.0	+0.1

6. Level - time stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limit (dB)
A-weight	94.0	94.0	0.0	+0.3

T. Petch

SITHIPORN ASSOCIATES CO., LTD. CALIBRATION LABORATORY

Cert. No. : ACL24008
Job No. : VC67AC0044
Pages : 4 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (dB)
137.0	137.6	0.6	+1.1
136.0	136.0	0.0	+1.1
135.0	135.0	0.0	+1.1
134.0	134.0	0.0	+1.1
133.0	133.0	0.0	+1.1
132.0	132.0	0.0	+1.1
131.0	131.0	0.0	+1.1
129.0	129.0	0.0	+1.1
124.0	124.0	0.0	+1.1
119.0	119.0	0.0	+1.1
114.0	114.0	0.0	+1.1
109.0	109.0	0.0	+1.1
104.0	104.0	0.0	+1.1
99.0	99.0	0.0	+1.1
94.0	94.0	0.0	+1.1
89.0	89.0	0.0	+1.1
84.0	84.0	0.0	+1.1
79.0	79.0	0.0	+1.1
74.0	74.0	0.0	+1.1
69.0	69.0	0.0	+1.1
64.0	64.0	0.0	+1.1
59.0	59.0	0.0	+1.1
54.0	54.0	0.0	+1.1
49.0	49.0	0.0	+1.1
44.0	44.0	0.0	+1.1
39.0	39.0	0.0	+1.1
34.0	34.0	0.0	+1.1
29.0	29.0	0.0	+1.1
24.0	24.0	0.0	+1.1
19.0	19.0	0.0	+1.1
14.0	14.0	0.0	+1.1
9.0	9.0	0.0	+1.1
4.0	4.0	0.0	+1.1

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Cert. No. : ACL24008
Job No. : VC67AC0044
Pages : 5 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (dB)
Audio	94.0	94.0	0.0	+1.1

9. Tone burst response

Time	Tone burst duration, T _b (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (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	100	134.0	134.0	0.0	+1.0
Slow	2	8	108.0	108.0	0.0	1.5, -5.0
	200	100	137.6	137.6	0.0	+1.0
	0.25	1	99.0	99.9	+0.1	1.5, -5.0
SEL	2	8	108.0	108.0	0.0	1.0, -2.5
	200	100	128.0	128.0	0.0	+1.0

10. Peak C sound level

Number of cycle in signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limit (dB)
Continuous	133.0	133.0	0.0	+2.0
One	136.4	136.3	-0.1	+2.0

Number of cycle in signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limit (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. Petch

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-57 / Pre-amplifier NH-14
Serial No. : R1173408 / L0408 / 22849
ID No. : RYO_150319

Condition As Found : GOOD

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

Location :
Ambient Temperature : $\pm 23.0 \pm 3.3$ °C
Pressure : $\pm 101.3 \pm 3.3$ kPa
Relative Humidity : $\pm 50.0 \pm 20.1$ %

Received Date : 19 DECEMBER 2023
Calibration Date : 05-08 JANUARY 2024
Date of Issue : 09 JANUARY 2024

Calibrated by : Nidaleen Petchsri

Approved by : *T. Petch*
(Thanakul Petchsri)

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SITHIPORN ASSOCIATES CO., LTD. CALIBRATION LABORATORY

Cert. No. : ACL24008
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 (93.9)	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	16.2
C-weight	22.1
Flat	28.0

3. Acoustical signal tests of frequency weightings

Meas free-field source response at a level of 94 dB

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limit (dB)
125	0.4	0.3	0.3	+1.5
1000	0.0	0.0	0.0	+1.0
6000	0.5	0.5	0.6	+5.0

T. Petch

Cert. No.: ACL24218
Job No.: VC67AC0118
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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	+0.4
136.0	136.0	0.0	+0.4
135.0	135.0	0.0	+0.4
134.0	134.0	0.0	+0.4
133.0	133.0	0.0	+0.4
132.0	132.0	0.0	+0.4
131.0	131.0	0.0	+0.4
130.0	130.0	0.0	+0.4
129.0	129.0	0.0	+0.4
128.0	128.0	0.0	+0.4
127.0	127.0	0.0	+0.4
126.0	126.0	0.0	+0.4
125.0	125.0	0.0	+0.4
124.0	124.0	0.0	+0.4
123.0	123.0	0.0	+0.4
122.0	122.0	0.0	+0.4
121.0	121.0	0.0	+0.4
120.0	120.0	0.0	+0.4
119.0	119.0	0.0	+0.4
118.0	118.0	0.0	+0.4
117.0	117.0	0.0	+0.4
116.0	116.0	0.0	+0.4
115.0	115.0	0.0	+0.4
114.0	114.0	0.0	+0.4
113.0	113.0	0.0	+0.4
112.0	112.0	0.0	+0.4
111.0	111.0	0.0	+0.4
110.0	110.0	0.0	+0.4
109.0	109.0	0.0	+0.4
108.0	108.0	0.0	+0.4
107.0	107.0	0.0	+0.4
106.0	106.0	0.0	+0.4
105.0	105.0	0.0	+0.4
104.0	104.0	0.0	+0.4
103.0	103.0	0.0	+0.4
102.0	102.0	0.0	+0.4
101.0	101.0	0.0	+0.4
100.0	100.0	0.0	+0.4
99.0	99.0	0.0	+0.4
98.0	98.0	0.0	+0.4
97.0	97.0	0.0	+0.4
96.0	96.0	0.0	+0.4
95.0	95.0	0.0	+0.4
94.0	94.0	0.0	+0.4
93.0	93.0	0.0	+0.4
92.0	92.0	0.0	+0.4
91.0	91.0	0.0	+0.4
90.0	90.0	0.0	+0.4
89.0	89.0	0.0	+0.4
88.0	88.0	0.0	+0.4
87.0	87.0	0.0	+0.4
86.0	86.0	0.0	+0.4
85.0	85.0	0.0	+0.4
84.0	84.0	0.0	+0.4
83.0	83.0	0.0	+0.4
82.0	82.0	0.0	+0.4
81.0	81.0	0.0	+0.4
80.0	80.0	0.0	+0.4
79.0	79.0	0.0	+0.4
78.0	78.0	0.0	+0.4
77.0	77.0	0.0	+0.4
76.0	76.0	0.0	+0.4
75.0	75.0	0.0	+0.4
74.0	74.0	0.0	+0.4
73.0	73.0	0.0	+0.4
72.0	72.0	0.0	+0.4
71.0	71.0	0.0	+0.4
70.0	70.0	0.0	+0.4
69.0	69.0	0.0	+0.4
68.0	68.0	0.0	+0.4
67.0	67.0	0.0	+0.4
66.0	66.0	0.0	+0.4
65.0	65.0	0.0	+0.4
64.0	64.0	0.0	+0.4
63.0	63.0	0.0	+0.4
62.0	62.0	0.0	+0.4
61.0	61.0	0.0	+0.4
60.0	60.0	0.0	+0.4
59.0	59.0	0.0	+0.4
58.0	58.0	0.0	+0.4
57.0	57.0	0.0	+0.4
56.0	56.0	0.0	+0.4
55.0	55.0	0.0	+0.4
54.0	54.0	0.0	+0.4
53.0	53.0	0.0	+0.4
52.0	52.0	0.0	+0.4
51.0	51.0	0.0	+0.4
50.0	50.0	0.0	+0.4
49.0	49.0	0.0	+0.4
48.0	48.0	0.0	+0.4
47.0	47.0	0.0	+0.4
46.0	46.0	0.0	+0.4
45.0	45.0	0.0	+0.4
44.0	44.0	0.0	+0.4
43.0	43.0	0.0	+0.4
42.0	42.0	0.0	+0.4
41.0	41.0	0.0	+0.4
40.0	40.0	0.0	+0.4
39.0	39.0	0.0	+0.4
38.0	38.0	0.0	+0.4
37.0	37.0	0.0	+0.4
36.0	36.0	0.0	+0.4
35.0	35.0	0.0	+0.4
34.0	34.0	0.0	+0.4
33.0	33.0	0.0	+0.4
32.0	32.0	0.0	+0.4
31.0	31.0	0.0	+0.4
30.0	30.0	0.0	+0.4
29.0	29.0	0.0	+0.4
28.0	28.0	0.0	+0.4
27.0	27.0	0.0	+0.4
26.0	26.0	0.0	+0.4
25.0	25.0	0.0	+0.4
24.0	24.0	0.0	+0.4
23.0	23.0	0.0	+0.4
22.0	22.0	0.0	+0.4
21.0	21.0	0.0	+0.4
20.0	20.0	0.0	+0.4
19.0	19.0	0.0	+0.4
18.0	18.0	0.0	+0.4
17.0	17.0	0.0	+0.4
16.0	16.0	0.0	+0.4
15.0	15.0	0.0	+0.4
14.0	14.0	0.0	+0.4
13.0	13.0	0.0	+0.4
12.0	12.0	0.0	+0.4
11.0	11.0	0.0	+0.4
10.0	10.0	0.0	+0.4
9.0	9.0	0.0	+0.4
8.0	8.0	0.0	+0.4
7.0	7.0	0.0	+0.4
6.0	6.0	0.0	+0.4
5.0	5.0	0.0	+0.4
4.0	4.0	0.0	+0.4
3.0	3.0	0.0	+0.4
2.0	2.0	0.0	+0.4
1.0	1.0	0.0	+0.4
0.0	0.0	0.0	+0.4
-1.0	-1.0	0.0	+0.4
-2.0	-2.0	0.0	+0.4
-3.0	-3.0	0.0	+0.4
-4.0	-4.0	0.0	+0.4
-5.0	-5.0	0.0	+0.4
-6.0	-6.0	0.0	+0.4
-7.0	-7.0	0.0	+0.4
-8.0	-8.0	0.0	+0.4
-9.0	-9.0	0.0	+0.4
-10.0	-10.0	0.0	+0.4
-11.0	-11.0	0.0	+0.4
-12.0	-12.0	0.0	+0.4
-13.0	-13.0	0.0	+0.4
-14.0	-14.0	0.0	+0.4
-15.0	-15.0	0.0	+0.4
-16.0	-16.0	0.0	+0.4
-17.0	-17.0	0.0	+0.4
-18.0	-18.0	0.0	+0.4
-19.0	-19.0	0.0	+0.4
-20.0	-20.0	0.0	+0.4
-21.0	-21.0	0.0	+0.4
-22.0	-22.0	0.0	+0.4
-23.0	-23.0	0.0	+0.4
-24.0	-24.0	0.0	+0.4
-25.0	-25.0	0.0	+0.4
-26.0	-26.0	0.0	+0.4
-27.0	-27.0	0.0	+0.4
-28.0	-28.0	0.0	+0.4
-29.0	-29.0	0.0	+0.4
-30.0	-30.0	0.0	+0.4
-31.0	-31.0	0.0	+0.4
-32.0	-32.0	0.0	+0.4
-33.0	-33.0	0.0	+0.4
-34.0	-34.0	0.0	+0.4
-35.0	-35.0	0.0	+0.4
-36.0	-36.0	0.0	+0.4
-37.0	-37.0	0.0	+0.4
-38.0	-38.0	0.0	+0.4
-39.0	-39.0	0.0	+0.4
-40.0	-40.0	0.0	+0.4
-41.0	-41.0	0.0	+0.4
-42.0	-42.0	0.0	+0.4
-43.0	-43.0	0.0	+0.4
-44.0	-44.0	0.0	+0.4
-45.0	-45.0	0.0	+0.4
-46.0	-46.0	0.0	+0.4
-47.0	-47.0	0.0	+0.4
-48.0	-48.0	0.0	+0.4
-49.0	-49.0	0.0	+0.4
-50.0	-50.0	0.0	+0.4
-51.0	-51.0	0.0	+0.4
-52.0	-52.0	0.0	+0.4
-53.0	-53.0	0.0	+0.4
-54.0	-54.0	0.0	+0.4
-55.0	-55.0	0.0	+0.4
-56.0	-56.0	0.0	+0.4
-57.0	-57.0	0.0	+0.4
-58.0	-58.0	0.0	+0.4
-59.0	-59.0	0.0	+0.4
-60.0	-60.0	0.0	+0.4
-61.0	-61.0	0.0	+0.4
-62.0	-62.0	0.0	+0.4
-63.0	-63.0	0.0	+0.4
-64.0	-64.0	0.0	+0.4
-65.0	-65.0	0.0	+0.4
-66.0	-66.0	0.0	+0.4
-67.0	-67.0	0.0	+0.4
-68.0	-68.0	0.0	+0.4
-69.0	-69.0	0.0	+0.4
-70.0	-70.0	0.0	+0.4
-71.0	-71.0	0.0	+0.4
-72.0	-72.0	0.0	+0.4
-73.0	-73.0	0.0	+0.4
-74.0	-74.0	0.0	+0.4
-75.0	-75.0	0.0	+0.4
-76.0	-76.0	0.0	+0.4
-77.0	-77.0	0.0	+0.4
-78.0	-78.0	0.0	+0.4
-79.0	-79.0	0.0	+0.4
-80.0	-80.0	0.0	+0.4
-81.0	-81.0	0.0	+0.4
-82.0	-82.0	0.0	+0.4
-83.0	-83.0	0.0	+0.4
-84.0	-84.0	0.0	+0.4
-85.0	-85.0	0.0	+0.4
-86.0	-86.0	0.0	+0.4
-87.0	-87.0	0.0	+0.4
-88.0	-88.0	0.0	+0.4
-89.0	-89.0	0.0	+0.4
-90.0	-90.0	0.0	+0.4
-91.0	-91.0	0.0	+0.4
-92.0	-92.0	0.0	+0.4
-93.0	-93.0	0.0	+0.4
-94.0	-94.0	0.0	+0.4
-95.0	-95.0	0.0	+0.4
-96.0	-96.0	0.0	+0.4
-97.0	-97.0	0.0	+0.4
-98.0	-98.0	0.0	+0.4
-99.0	-99.0	0.0	+0.4
-100.0	-100.0	0.0	+0.4

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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	+0.3

9. Time burst response

Time	Time burst duration, T _b (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	1	1	106.0	107.0	+0.1	+0.1, -0.0
	2	2	117.0	117.0	0.0	+0.1, -0.1
	200	200	134.0	134.0	0.0	+0.1, -0.0
Slow	2	2	106.0	106.0	0.0	+0.1, -0.0
	200	200	127.0	127.0	0.0	+0.1, -0.0
	200	200	127.0	127.0	0.0	+0.1, -0.0
SEL	200	200	127.0	127.0	0.0	+0.1, -0.0
	2	2	106.0	106.0	0.0	+0.1, -0.1
	200	200	126.0	126.0	0.0	+0.1, -0.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	+0.0
One	136.4	135.3	-0.9	+0.0

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	+0.0
Positive half cycle	135.4	135.1	-0.3	+0.0
Negative half cycle	135.4	135.1	-0.3	+0.0

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11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive over half cycle	Negative over half cycle		
99.7	99.5	-0.1	±1.5

12. High level stability

Frequency Weighting	SLM Display at final (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 a 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 Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-52A / Mono phone UC-59 / Preamp for NH-25
Serial No. : 00531295 / 22064 / 32971
ID No. : NH, F50431

Condition As Found : GOOD

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

Location : +
Ambient Temperature : (13.0 ± 3.0) °C
Pressure : (1013.2 ± 1.0) hPa
Relative Humidity : (50.0 ± 2.0) %

Received Date : 02 JULY 2024

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K. 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	+0.5

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	105.0	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	0.25	1	105.0	108.0	0.0	1.0, -3.0
	2	8	117.6	117.6	0.0	+0.5
	200	800	134.0	134.0	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	124.0	124.0	0.0	+0.5

10. Peak C-weight level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Leqpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	+2.0
One	135.4	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	135.3	-0.3	+1.0
Negative half cycle	135.4	135.1	-0.3	+1.0

11. Overload indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Passing one-half cycle	99.6	0.1
one-half cycle	99.6	0.1

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 report of conformity 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

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-55A / Microphone UC-59 / Tri-amp/Ger NI-25
Serial No. : 0031297/2020 / 12973
ID No. : NKL F50131

Condition As Found : GOOD

Customer : KAS LABORATORY GROUP (THAILAND) CO., LTD.
(34 PHA THANAKAN 40 PHATHANAKAN ROAD
KHAOYANG PHATHANAKAN, KHAOYANG SUAN LUANG,
BANGKOK, 10250 THAILAND.)

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

Received Date : 02 JULY 2024
Calibration Date : 09-10 JULY 2024
Date of Issue : 12 JULY 2024

Calibrated by : Nithakorn Pichasri

Approved by : T. Rthn.
(Nithakorn Pichasri)

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

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Calibration Procedure : CP-AC-61

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 A-weight, chamber and Reference Standard Instruments.

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

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	22210A	MY48017076	IF-0029-24	05-FEB-25
Waveform Generator	33511B	MY3302742	IF-0027-24	05-FEB-25
Digital Multimeter	33461A	MY3320104	EEL-AP-219057	13-FEB-25
Digital Multimeter	33461A	MY3320076	EEL-AP-200567	13-FEB-25
Digital Multimeter	34461A	MY60034273	EEL-AP-220567	13-FEB-25
Programmable Attenuator	NAT-1070	62100114	EF-0008-24	05-FEB-25
Credentia Microphone	2180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	3456495	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 :

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

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	0.1	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-weight level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
93.4 ± 0.3 dB	94.0	0.0	+0.3

2. Self-generated noise

2.1 Normal use

Measured Value (dB)
11.6

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

Frequency Weighting	Weighting
A-weight	6.7
C-weight	14.6
Flat	20.2

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviated Value various frequency weighting response meter (dB)	Acceptance Limits
125	0.1	0.1
1000	0.1	0.1
8000	0.0	0.1

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4. Electrical signal tests of frequency weightings

Frequency (Hz)	Deviated Value various frequency weighting response meter (dB)	Acceptance Limits
80	0.0	0.0
125	0.0	0.0
250	0.0	0.0
500	0.0	0.0
1000	0.0	0.0
2000	0.0	0.0
4000	0.0	0.0
8000	0.0	0.1
16000	-0.0	-1.2

5. Frequency and time weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.6	94.6	0.0	+0.2
C-weight	94.6	94.0	0.0	+0.2
Flat	94.0	94.0	0.0	+0.2

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
Log	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

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	+0.6
136.0	136.0	0.0	+0.6
135.0	135.0	0.0	+0.6
134.0	134.0	0.0	+0.6
133.0	133.0	0.0	+0.6
132.0	132.0	0.0	+0.6
131.0	131.0	0.0	+0.6
129.0	129.0	0.0	+0.6
124.0	124.0	0.0	+0.6
119.0	119.0	0.0	+0.6
114.0	114.0	0.0	+0.6
109.0	109.0	0.0	+0.6
104.0	104.0	0.0	+0.6
99.0	99.0	0.0	+0.6
94.0	94.0	0.0	+0.6
89.0	89.0	0.0	+0.6
84.0	84.0	0.0	+0.6
79.0	79.0	0.0	+0.6
74.0	74.0	0.0	+0.6
69.0	69.0	0.0	+0.6
64.0	64.0	0.0	+0.6
59.0	59.0	0.0	+0.6
54.0	54.0	0.0	+0.6
49.0	49.0	0.0	+0.6
44.0	44.0	0.0	+0.6
39.0	39.0	0.0	+0.6
34.0	34.0	0.0	+0.6
29.0	29.0	0.0	+0.6
24.0	24.0	0.0	+0.6
19.0	19.0	0.0	+0.6
14.0	14.0	0.0	+0.6
9.0	9.0	0.0	+0.6

K. 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	+0.5

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	105.0	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	0.25	1	105.0	108.0	0.0	1.0, -3.0
	2	8	117.6	117.6	0.0	+0.5
	200	800	134.0	134.0	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	124.0	124.0	0.0	+0.5

10. Peak C-weight level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	+2.0
One	135.4	135.3	-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	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. : ACL24224
Job No. : VC67AC0118
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11. Overall indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle	0.0
99.5	99.6	±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

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Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-52A + Microphone UC-59 / Propana for N1-25
Serial No. : 00531209 / 23223 / 12975
ID No. : NKGH_150115

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTANAKAN 40, PHATTANAKAN ROAD,
KHWAENG PHATHANAKAN, KHUET SUAN LUANG,
BANGKOK, 10150 THAILAND

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

Received Date : 02 JULY 2024
Calibration Date : 09-10 JULY 2024
Date of Issue : 12 JULY 2024

Calibrated by : Nitakul Pootphol

Approved by : *T. Rth.*
(Thakul Pootphol)

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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Job No. : VC67AC0118
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Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC 61672-1 (2013) Standard for sound level meter (SLM). The SLM test leads to Acoustical and Electrical signal level of frequency weighting with Acoustic chamber and Reference Standard Instruments.

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

Condition of this result of calibration :

1. Reference Standard Instruments

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017075	EF-0009-24	05 FEB-25
Waveform Generator	33511R	MY53202542	EF-0007-24	05 FEB-25
Digital Multimeter	33461A	MY53210104	FTL-RP 210257	13 FEB-25
Digital Multimeter	33461A	MY53220075	FTL-RP 2010267	15 FEB-25
Digital Multimeter	33461A	MY60024273	FTL-RP 2210267	15 FEB-25
Programmable Attenuator	MAT-1070	62100114	FT-0008-24	05 FEB-25
Customer Microphone	4140	597500	AA-1001-24	12 FEB-25
Measuring Amplifier	NA-43KAI	3450495	AA-1001-24	05 FEB-25

2. This result of calibration is found accurate as shown on this final place of calibration for this calibrated item only.

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

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

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Summary of Measurement Result:

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
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 accuracy on the reference level range	0.2	0.1
8. Level accuracy including the level range control	0.2	0.1
9. Tone burst response	0.2	0.1
10. Peak C-weight level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

Result of calibration:

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.0 (±0.04)	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	Wornging (dB)
A-weight	9.9
C-weight	14.9
Flat	20.5

3. Acoustical signal tests of frequency weightings

Mean free field acoustic response at a level of 94 dB

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance
125	0.0	0.0	0.0	±1.0
1000	0.0	0.0	0.0	±0.7
8000	0.1	0.5	0.6	±1.5, ±2.5

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
43	0.1	0.1	-0.1	±1.0
125	0.0	0.0	0.0	±1.0
250	0.0	0.0	0.0	±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, ±6.0

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 weightings 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
Long	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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7. Level accuracy 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	±0.9
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
128.0	128.0	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	0.1	±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	34.1	0.1	±0.8
29.0	29.0	0.0	±0.8
24.0	24.0	0.0	±0.8
19.0	19.0	0.0	±0.8
14.0	14.0	0.0	±0.8
9.0	9.0	0.0	±0.8
4.0	4.0	0.0	±0.8

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8. Level accuracy 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

Tone Weighting	Tone burst duration, 1/s	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	2	8	109.0	107.9	-0.1	1.0, -3.0
			114.0	114.0	0.0	1.0, -1.5
Slow	2	8	109.0	108.0	-0.9	1.0, -3.0
			114.0	114.0	0.0	1.0, -1.5
SEL	2	8	109.0	108.0	-0.1	1.0, -3.0
			114.0	114.0	0.0	1.0, -1.5

10. Peak C-weight level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Once	133.4	133.4	-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	132.9	-0.1	±1.0
Positive half cycle	133.4	133.1	-0.3	±1.0
Negative half cycle	133.4	133.1	-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	0.0
99.5	99.6	±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



Cert. No.: 24PM171
Page: 2 of 2

Result of calibration: () Without adjustment () After adjustment				
Function: Illuminance Measurement				
Standard Value	Before Adjust	After Adjust	Error	Uncertainty
(lx)	(lx)	(lx)	(lx)	(lx)
5	0.00	0.00	0.00	-
15	-	15.18	0.18	0.22
100	-	100.6	0.6	1.5
500	-	490	-10	7.1
1000	923	1000	0	15
2000	-	2028	28	29
3000	-	3030	30	44
4000	-	4060	60	58
5000	4710	5000	0	73

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 %

Before adjustment light source factor setting mode: L0 = 1.284
After adjustment light source factor setting mode: L0 = 1.389
UUC* = Unit Under Calibration

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES
115/101 Moo 3, T. Bangpa, A. Kaengkhro, Saraburi 8110, Thailand
Tel: 0877030047 Fax: 02740482



Certificate of Calibration

Certification No.: 23C1574
Page: 1 of 2

Equipment:	pH Meter	The certificate may not be reproduced other than in full, except with the prior written approval of the head of Corporate Services & Equipment Calibration and Testing Services
Manufacturer:	Mettler Toledo	
Model:	SevenExcellence	
Serial No.:	B534291445	
ID No.:	RYG_EN0152	
Condition As Received:	Used Item	
Received Date:	08 December 2023	
Calibration Date:	14 December 2023	
Reference:	2312-0151D5C-3	Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. Rayong Branch 616/10 Moo 5, T. Maenam Khu, A. Phukdaeng, Rayong 21140, Thailand
Ambient Temperature:	23.5 ± 0.5 °C	
Relative Humidity:	53 ± 10 %	

Procedure used: Calibration was performed using calibration procedure No. CP-017 according to GUM/ISO 17025

Content of this result of calibration

1. Reference standard instrument

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Multi-Product Calibrator	5552A	043052	ES-0947-23	29 Apr 2024

2) The result of calibration was made on request at the point specified by customer.
3) The certificate is valid only to the item calibrated on date and place of calibration.
4) This Certificate is traceable to the International System of Unit maintained through:
National Institute of Metrology (NIM), Japan



Calibrated by:	Reecha Pilsantithukol	Approved Signature:	[Signature]
Issue Date:	15 December 2023		

0.0331106

0.1193422



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Cert. No.: 23CH1574
Page: 1 of 3

Certificate of Calibration

Equipment:	pH Meter
Manufacturer:	Mettler Toledo
Model:	SevenExcellence
Serial No.:	B534291445
ID No.:	RYG_EN0152
Condition As Received:	Used Item
Received Date:	08 December 2023
Calibration Date:	15 December 2023
Reference:	2312-0151D5C-3
Submitted by:	ALS Laboratory Group (Thailand) Co., Ltd. Rayong Branch 616/10 Moo 5, T. Maenam Khu, A. Phukdaeng, Rayong 21140, Thailand
Ambient Temperature:	(25 ± 2.5) °C
Relative Humidity:	(50 ± 15) %
Calibration Procedure:	In-house method - CP-CH6 by direct measurement with standard voltage calibrator and direct measurement with certified reference material (CRM) - CP-CH6 by comparison with standard thermometer

Calibrated by: Wasirom Lemgajakul

Approved by: [Signature]

() Ratchapong Meangrai
() Jiraporn Lemgajakul
() Pongpan Papan

Issue Date: 19 December 2023

The uncertainties are for a confidence probability of approximately 95 %

This certificate is issued in accordance with the requirements of ISO 17025:2017

Name of the User: Pongpan Papan, Equipment: pH meter, T141120

0.051695

Cert. No.: 23CH1574
Page: 2 of 3

Condition of this calibration result

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54032048	130R110	23C2502	27 Aug 2024
2) Ref. Standard Thermometer	4810254	1101C044	23A16	26 July 2024

This certification is traceable to the International System of Unit maintained through:
- Technology Promotion Association (Thailand-Japan)

2. Certified Reference Materials: The measurement results are traceable to SI through CPA chem Ltd., A959-A952 National Accreditation Board, Accredited for: A959-A952

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.008	CPA chem	913598	14 July 2025
pH 6.86	CPA chem	913598	01 Oct 2024
pH 7.407	CPA chem	940108	02 Nov 2024

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

Calibration Results

Function: pH Measurement

Performing standard curve by Fluke at pH (4.7, 6.8)

Unit Under Calibration	Nominal Value	Standard Voltage	Actual Reading	Uncertainty of Measurement	Coverage factor
pH Meter	pH	mV	mV	pH	
S/N: B034291445	4.000	177.48	177.3	0.059	2.00
	7.000	0.00	-0.1	7.000	0.059
	10.000	-177.48	-177.5	0.059	2.00



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Tel: 0877030047 Fax: 02740482

Cert. No.: 23CH1574
Page: 3 of 3

Calibration Results

Function: pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4.7, 6.8)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading	Uncertainty of pH measurement	Coverage factor
pH Electrode	4.008	4.013	184.1	0.0045	2.00
S/N: 3225368	6.86	6.919	6.7	0.0084	2.00
	9.99	10.002	-152.7	0.0085	2.11

Function: Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe

Model: InLabRExpert Pro-ISM

Serial No: 3225368

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
25.0	25.003	24.3	-0.703	0.13	2.00

Remark: UUC* = Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a level of confidence of approximately 95 %

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Metrology
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Website: www.sci-eco.co.th E-Mail: sa@sci-eco.co.th



Certificate No. T241120

Page 1 of 4

Certificate of Calibration

Equipment:	Chamber (Cold Room)
Manufacturer:	MODULAR
Model:	IREVCOHCOO
Serial No.:	C00351459
Customer Code:	RYG_EN0184
ID No.:	T1939A5
Customer:	ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch) 616/10 Moo 5, T. Maenam Khu, A. Phukdaeng, Rayong 21140
Customer Location:	Laboratory
Date of Receipt:	5 June 2024
Calibrated By:	Sujjar Nakhakred (Site Calibration Manager)
Approved By:	Precha Pilsantithukol (Temperature Calibration Manager)
Date of Issue:	17 JUN 2024

The uncertainties are for a confidence probability of approximately 95 %

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its compliance to recognized national standards and to the units of measurement realized at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrology.

T241120-01-00-00



Metrology
SCI ECO Services Company Limited
332 Moo 3 T. Bangpa, A. Kaengkhro, Saraburi 8110, Thailand



Certificate No. T241120

Page 2 of 4

Calibration Report

Equipment:	Chamber (Cold Room)
Date of Calibration:	11 June 2024
Environment:	Temperature: 23.1-24.1 °C Line Voltage: 222.3-226.3 V Relative Humidity: 55-65 %RH

Condition of this result of calibration

1) This equipment was calibrated by inserting standard thermocouples type T, probe in chamber, the outer one standard thermocouple type T use for ambient temperature measurement. The calibration is valid in accordance with ISO 17025 (based on AS/ISO 17025:2017) and AS/ISO 17025:2017.

All data were taken from final values and the final data from customer request. The temperature scale used was based on ITS-90

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	TYDET	TN161-TN170	T240713	19 April 2025
TC	TYDET	TN171-TN180	T240713	19 April 2025
DATA LOGGERS	3497DA	T149	T240713	19 April 2025

2) This certificate is traceable to:
National Institute of Metrology (NIM), Thailand through National Metrology Center (NIM-TIS) T240713 (T240713)

3) Conditions of calibrated item: good

Environmental Disposition:	3 Hour	30 Minute	As 3 °C
Fresh Air Disposition:	Open	Close	Max
	Open	Close	Max
	Open	Close	Max

4) Adjustment: () Without adjustment () X 1 after adjustment

Approved By: [Signature]

Approved By: [Signature]

T241120-01-00-00

T241120-01-00-00



Certificate No. T241120

Calibration Report

Page 4 of 4

Measurement Results:

Calibration Point	Average Standard Reading at each position (°C)							
	TN10	TN12	TN14	TN16	TN18	TN20	TN22	TN24
3	2.75	2.76	2.77	2.78	2.79	2.80	2.81	2.82
	TN10	TN12	TN14	TN16	TN18	TN20	TN22	TN24
	3.10	3.11	3.12	3.13	3.14	3.15	3.16	3.17

Chamber (Cold Room)				Temperature Distribution				
Setting (°C)	Reading (°C)		Average (°C)	Stability (°C)	Uniformity (°C)	Uncertainty (°C)	Coverage Factor k	
	Min	Max						
10	2.7	4.4	3.5	2.0	1.0	1.0	2.0	

* The reported uncertainty includes "k=2" uncertainty.
The reference value may vary slightly for other calibration items.
The result of use was found accurate as shown on data sheet and file attached.
The reported expanded uncertainty is based on a normal distribution (by multiplying by a coverage factor k=2) for a distribution providing a level of confidence of approximately 95%.

Approved By:

Certificate of Testing

Equipment: DO Meter
Manufacturer: YSI
Model: 9000-115V
Serial No.: 15E102706
ID No.: RYG-EN10032
Received Date: 21 July 2023
Test Date: 24 July 2023
Reference: 2307-0713050-1
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd.
Raying Branch
616/10 Moo 5, T. Maenam Klu, A. Phukdang
Raying 21140, Thailand.
Laboratory Condition: Temperature: (25 ± 5) °C
Humidity: (50 ± 20) %
In-house method: CP-049
Test Procedure: by Comparison Technique with Aids Modification Method

Tested by:
Approved by:
Approved Signature

() Jakkas Boonwong
() Sathip Manayong
() Waranorn Limpapitakul

Issue Date: 26 July 2023

Cert. No.: 237M168
Page: 1 of 2

Condition of this result of calibration

1. Reference Standard Instruments:
This certificate is traceable to the International System of Unit through the reference standards laboratory of In-house Calibration Center, Technology Promotion Association (Thailand-Japan).

Instrument	Serial No.	ID No.	Certificate No.	Exp. Date
1) Burate	1308U10	23CG1172	22 Mar 2025	
2) Balance	1126142784	140RC004	22 Mar 2025	

Material	Manufacturer	Lot No.	Amount
5-chloro Thiosulfate pentahydrate	Merck	AM1753316	100.2%

Result: Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 15E100664

Titration Method (Aide Modification Method)	DO Meter Reading	Standard Deviation
(mg/L)	(mg/L)	(mg/L)
8.18	8.17	0.055

This report was certified only for the instrument we tested. It is acceptable to use for only the system efficiency. The environmental impact control and present to organization 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.

-00-

0370211
01172155



Cert. No.: 23M1835
Page: 1 of 2

Certificate of Calibration

Equipment: DO Meter with Sensor
Manufacturer: YSI
Model: 9000-115V
Serial No.: 15E102706
ID No.: RYG-EN10032
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd.
Raying Branch
616/10 Moo 5, T. Maenam Klu, A. Phukdang
Raying 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 Hlab

Approved by:
Approved Signature

() Porntipa Tanayakul
() Maita Boonwong
() Sathip Manayong

Issue Date: 31 July 2023

The Uncertainty is for a confidence probability of approximately 95%.

This certificate may not be reproduced other than in full, except with the prior written approval of the head of Corporate Services & Equipment Calibration and Testing Services.

0603516



Equipment: DO Meter with Sensor
Condition As-Received: Used Item
Reference: 2307-0713050-1
Procedure Used: >

Calibration was conducted using in-house calibration procedure CP-0101 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 2110003 221285 TPA 21 Oct 2023
2. This certificate is valid only to the item calibrated on date and name 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: Temperature measurement.

Calibration Point (°C)	Instrument Point (mm)	Standard Temperature (°C)	Reading (°C)	Error (°C)	Uncertainty (°C)	Coverage Factor k
100	100	20.611	19.91	-0.701	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%.

-00-

Cert. No.: 23M1825
Page: 2 of 2



Certificate of Calibration

Cert. No.: 24TM1803
Page: 1 of 3

Equipment: Low Temp. Incubator
Manufacturer: Marmet
Model: IPP750
Serial No.: V818.0004
ID No.: RYG-EN10154
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. Raying Branch
616/10 Moo 5, T. Maenam Klu, A. Phukdang
Raying 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:
Approved by:
Approved Signature
() Porntipa Tanayakul
() Maita Boonwong
() Sathip Manayong

Issue Date: 07 November 2024

The Uncertainty is for a confidence probability of approximately 95%.

This certificate may not be reproduced other than in full, except with the prior written approval of the head of Corporate Services & Equipment Calibration and Testing Services.

1159515



Equipment: Low Temp. Incubator
Condition As-Received: Used Item
Reference: 2411-000200-1
Procedure Used: >

Calibration was conducted using calibration procedure CP-0102 based on TLAS O-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. Traceable Due Date
1) Data Acquisition MY447381 24LM73 TPA 18 May 2025
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)

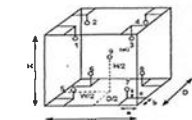
Result of Calibration: (*) Without Adjustment

Function of UUC: Temperature Source

Fresh air setting: Close

Environment during calibration	
Temp. (°C)	24
REL Humid. (%)	53
AC Supply (Volt)	220

Position	Rtd. ID No.
1	18TD-01
2	18TD-02
3	22-01RTD-03
4	18TD-04
5	18TD-05
6	18TD-06
7	23-01RTD-07
8	18TD-08
9 (ref.)	23-01RTD-09



Probe Installation Details: a = 10 cm, b = 10 cm, c = 10 cm
Dimension of Chamber: D = 0.80 m, W = 1.0 m, H = 1.2 m
Capacity = 0.72 m³



Equipment: Low Temp. Incubator
Condition As-Received: Used Item
Reference: 2411-000200-1
Result of Calibration: (*) Without Adjustment
Function of UUC: Temperature Source
Fresh air setting: Close

Calibration Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Temperature stability (°C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor k
20.0	20.0	20.0	0.026	0.26	0.53	2

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-

Cert. No.: 24TM1803
Page: 3 of 3



Certificate of Calibration

Cert. No.: 24CG0715
Page: 1 of 2

Equipment: Burate
Capacity: 50 mL
Serial No.: RYG-EN10216
ID No.: RYG-EN10216
Manufacturer: Wiyag
Made in: Germany
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. Raying Branch
616/10 Moo 5, T. Maenam Klu, A. Phukdang
Raying 21140, Thailand
Ambient Temperature: (20 ± 2.5) °C
Relative Humidity: (50 ± 10) %
Barometric Pressure: 759 mmHg
Calibration Procedure: ASTM E 942 - 01
Calibrated by: Sangsarnkarn Wongsa
Approved by:
Approved Signature
() Porntipa Tanayakul
() Maita Boonwong
() Sathip Manayong

Issue Date: 24 September 2024

The Uncertainty is for a confidence probability of approximately 95%.

This certificate may not be reproduced other than in full, except with the prior written approval of the head of Corporate Services & Equipment Calibration and Testing Services.



Equipment : Balance
Received Date : 19 September 2024
Condition As-Received : Used Item
Calibration Date : 24 September 2024
Reference : 2409-0750QD-3

Cert.No.: 24030711
Page: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments:
- | Instrument | Model | Serial No. | ID No. | Certificate No. | Traceability | Due date |
|----------------|--------|------------|----------|-----------------|--------------|--------------|
| 1) Balance | XP205 | 6134209712 | 1469C007 | 2404M318 | TPA | 15 July 2025 |
| 2) Data Logger | HL-200 | 20663158 | 146C0212 | 23H2174 | TPA | 10 Oct 2024 |
| 3) Thermometer | - | 1594582 | 146C0210 | 241175 | TPA | 20 Feb 2025 |

This certificate is traceable to SI Unit.

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

3. This value is converted to true value at the standard temperature of 20 °C.

Calibration result:

Nominal capacity (mL)	Reading (mL)	Uncertainty (± mL)	k Factor
10	10.0259	0.0002	2.00
20	20.0214	0.0005	2.00
30	30.0096	0.0009	2.00
40	40.0003	0.0004	2.00
50	49.9989	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 %.

-000-



Certificate of Calibration

Equipment: SPECTROPHOTOMETER
Model: DR6000
Serial No. (or ID): 1527545 (RYG_EN0037)
Manufacturer: HACH
Condition: In Condition

Certificate No.: C0230441
Issued Date: 19 September 2023
Job No.: WO-00005362
Page: 1 of 3

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

Environment Condition:

Temperature: 23.9 °C ± 0.2 °C

Humidity: 65.3 %RH ± 1.4 %RH

Calibration Place:

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

Calibration By:

Mr. Nataporn Rungruang

Calibration Date:

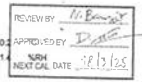
18 September 2023

The Method Used:

In house method, CAL-VI-24, based 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 Sigma Scientific Limited.
The standard for Wavelength Certificate No. 111563 and 111564
The standard for Photometric Certificate No. 9114984 and 111558
The standard for Slit Light Certificate No. 111568 and 111565
The standard for Spectral resolution Certificate No. 111567



(Mr. Nataporn Rungruang)

(Mr. Nataporn Rungruang)

This certificate is based on the data of measurement according to the International System of Units (SI). It is issued under the condition that the measurement is traceable to the International System of Units (SI).
The measurement uncertainty stated in this certificate is based on 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).
These results may be affected by conditions not specified herein. The results apply only to the items listed, addressed or sampled. The report and its contents are not to be reproduced or used in any manner without the prior written consent of DKSH (Thailand) Co., Ltd.

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CAL-FM-006-18 12 Sep 2022



Certificate No.: C0230441
Page 3 of 3

Calibration Results:

Without Adjustment

Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
225 nm	0.0000	0.0000	0.0000	0.0003
225 nm	0.7355	0.737	-0.0015	0.0003
257 nm	0.0000	0.0000	0.0000	0.0002
257 nm	0.8574	0.857	0.0004	0.0002
313 nm	0.0000	0.0000	0.0000	0.0000
313 nm	0.2864	0.290	-0.0035	0.0003
350 nm	0.0000	0.0000	0.0000	0.0003
350 nm	0.6374	0.637	0.0004	0.0003
Slit Light *				
Standard out-off	UUC: Wavelength (nm)	UUC: Transmission (%)	Absorbance (A)	
250.82 ± 0.11 nm	260.8	1.3	1.866	
391.44 ± 0.11 nm	391.4	1.3	1.866	
Spectral Resolution *				
Nominal Concentration 0.02 % v/v	Peak	Trough	Ratio	SDW
Standard Wavelength (nm)	268.66	268.69	1.38	2.30
UUC: Wavelength (nm)	268.2	266.1		
Std Absorbance (A)	0.4596	0.2770		
Absorbance (A)	0.413	0.300		

* Calibration Method "Not TSI Accredited" in this Certificate have been included for completeness.

The End of Certificate

4th Edition (Rev. 1) 1st Ed.
DKSH (Thailand) Co., Ltd.
120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

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CAL-FM-006-18 12 Sep 2022



ใบตรวจสอบสภาพเครื่องวัดชนิดอื่น

รหัสเครื่อง: SPECTROPHOTOMETER		ยี่ห้อ: DR6000		วันที่บันทึก: WO-000633	
วันที่ตรวจ (ปี)		วันที่ตรวจ (ปี)		วันที่ตรวจ (ปี)	
18 Sep 2023		18 Sep 2023		18 Sep 2023	
Unit		Unit		Unit	
Unit	Unit	Unit	Unit	Unit	Unit
General					
<input type="checkbox"/>	<input type="checkbox"/>	1. ความถูกต้อง (Accuracy)			
<input type="checkbox"/>	<input type="checkbox"/>	2. ความละเอียด (Resolution)			
<input type="checkbox"/>	<input type="checkbox"/>	3. ความแม่นยำ (Precision)			
<input type="checkbox"/>	<input type="checkbox"/>	4. ความเสถียร (Stability)			
<input type="checkbox"/>	<input type="checkbox"/>	5. ความทนทาน (Durability)			
Spectrophotometer					
<input type="checkbox"/>	<input type="checkbox"/>	6. แหล่งจ่ายไฟ (Battery Backup)	≥ 2.5 VDC		
<input type="checkbox"/>	<input type="checkbox"/>	7. ควบคุมอุณหภูมิ (Wavelength Control)			
<input type="checkbox"/>	<input type="checkbox"/>	8. ความยาวคลื่น (Wavelength Check)			*
<input type="checkbox"/>	<input type="checkbox"/>	9. ความยาวคลื่น (Wavelength Check)			9.2 Hours
<input type="checkbox"/>	<input type="checkbox"/>	10. ความยาวคลื่น (Wavelength Check)			741.5 Hours
<input type="checkbox"/>	<input type="checkbox"/>	11. ความยาวคลื่น (Wavelength Check)			
pH Meter and Conductivity Meter					
<input type="checkbox"/>	<input type="checkbox"/>	12. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	13. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	14. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	15. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	16. ความยาวคลื่น (Wavelength Check)			
Turbidimeter					
<input type="checkbox"/>	<input type="checkbox"/>	17. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	18. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	19. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	20. ความยาวคลื่น (Wavelength Check)			
Automatic Diluter					
<input type="checkbox"/>	<input type="checkbox"/>	21. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	22. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	23. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	24. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	25. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	26. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	27. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	28. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	29. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	30. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	31. ความยาวคลื่น (Wavelength Check)			
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<input type="checkbox"/>	<input type="checkbox"/>	34. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	35. ความยาวคลื่น (Wavelength Check)			
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<input type="checkbox"/>	<input type="checkbox"/>	41. ความยาวคลื่น (Wavelength Check)			
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<input type="checkbox"/>	<input type="checkbox"/>	80. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	81. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	82. ความยาวคลื่น (Wavelength Check)			
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<input type="checkbox"/>	<input type="checkbox"/>	86. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	87. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	88. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	89. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	90. ความยาวคลื่น (Wavelength Check)			
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<input type="checkbox"/>	<input type="checkbox"/>	96. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	97. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	98. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	99. ความยาวคลื่น (Wavelength Check)			
<input type="checkbox"/>	<input type="checkbox"/>	100. ความยาวคลื่น (Wavelength Check)			
ผลการตรวจ: 100% (Pass) 10m					
100% (Pass) 10m					



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2403-0563OC-1
Result of Calibration : (*) Without Adjustment
Function of UUC : Temperature Source
Fits as setting : Close

Cert. No.: 24TM002
Page : 3 of 3

Calibration Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Temperature stability (°C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor
104.0	104.0	104.0	0.051	0.54	0.62	2
160.0	160.0	160.0	0.15	1.3	1.7	2

Calibration Point (°C)	1	2	3	4	5	6	7	8	9 (ref.)	Uncertainty (°C)
104.0	103.821	103.798	103.797	103.759	103.890	103.817	104.213	103.872	103.873	0.42
160.0	159.814	159.270	159.143	159.549	160.001	160.423	160.263	160.629	159.429	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 temperature at any sensor and the measured temperature at the reference location which are observed at the same time or at 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 temperature 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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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES
3344 PATTANAKARNI ROAD SOI 18, SUKHUMVIT, SUKHUMVIT BANGKOK 10250
TEL. 0-2717-3000-29 FAX 0-2719-9484



Certificate of Calibration

Cert. No.: 24TM034
Page : 1 of 3

Equipment : Hot Air Oven

Manufacturer : Memmert

Model : UF 110

Serial No. : RM23-0853

ID No. : RYG-EN215

Submitted by : ALS Laboratory Group (Thailand) Co., Ltd. (Rajong Rong)

Location : 61610 Moo 5 T. Maenam Kho, A. Phakleng, Rayong 21140 Thailand

Received Order : 21 March 2024

Calibration Date : 21 - 23 March 2024

Ambient Temperature : (20 ± 0.1) °C

Relative Humidity : (50 ± 3) %

Calibrated by : Man Pallempangpoo

Approved by :

() Pongthip Tameyabul
() Unnaphol Hanchai
(x) Suat Injai

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
Result of Calibration : (*) Without Adjustment
Function of UUC : Temperature Source
Fits as setting : Close

Cert. No.: 24TM034
Page : 3 of 3

Calibration Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Temperature stability (°C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor
104.0	104.0	104.0	0.065	0.52	0.60	2
160.0	160.0	160.0	0.20	1.2	2.0	2

Calibration Point (°C)	1	2	3	4	5	6	7	8	9 (ref.)	Uncertainty (°C)
104.0	104.169	103.906	103.880	103.712	103.772	103.730	104.249	103.809	103.798	0.42
160.0	160.701	159.236	159.535	159.680	160.127	160.134	160.644	159.313	160.211	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 temperature at any sensor and the measured temperature at the reference location which are observed at the same time or at 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 temperature 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.: 24TM035
Page : 1 of 3

Equipment : Water Bath

Manufacturer : Memmert

Model : WHW22

Serial No. : L813-0548

ID No. : RYG-EN081

Submitted by : ALS Laboratory Group (Thailand) Co., Ltd. (Rajong Rong)

Location : 61610 Moo 5 T. Maenam Kho, A. Phakleng, Rayong 21140 Thailand

Received Order : 21 March 2024

Calibration Date : 21 March 2024

Ambient Temperature : (20 ± 0.1) °C

Relative Humidity : (50 ± 3) %

Calibrated by : Man Pallempangpoo

Approved by :

() Pongthip Tameyabul
() Unnaphol Hanchai
(x) Suat Injai

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
Result of Calibration : (*) Without Adjustment
Function of UUC : Temperature Source

Cert. No.: 24TM035
Page : 3 of 3

Calibration point (°C)	UUC Setting (°C)	UUC Reading (°C)	Average Standard Reading (°C)	Uncertainty (°C)
55.0	55.0	55.0	55.423	0.16
65.0	65.0	65.0	65.423	0.16

Calibration point (°C)	1	2	3	4	5 (ref.)	Uncertainty (°C)
55.0	55.0	55.0	55.0	55.0	55.0	0.16
65.0	65.0	65.0	65.0	65.0	65.0	0.16

Average : The average of 30 values in each position.

Uniformity : The maximum difference of measured temperature at any sensor and the measured temperature at the reference location which are observed at the same time or at 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.: 24CH01
Page : 1 of 3

Equipment : pH Meter

Manufacturer : Metro Toledo

Model : SevenGo

Serial No. : B02875164

ID No. : RYG-FSC02

Condition As-Received : Used Item

Received Date : 17 January 2024

Calibration Date : 15 January 2024

Reference : 241-C8510SC-1

Submitted by : ALS Laboratory Group (Thailand) Co., Ltd. (Rajong Rong)

Location : 61610 Moo 5 T. Maenam Kho, A. Phakleng, Rayong 21140 Thailand

Ambient Temperature : (25 ± 2.5) °C

Relative Humidity : (50 ± 15) %

Calibration Procedure : In-house method

- CP-G15 by direct measurement with standard standard voltage and direct measurement with certified reference material (CRM)

- CP-G16 by comparison with temperature standard

Calibrated by : Winkom Lemgagrakul

Approved by :

(x) Saeid Meviana
() Winkom Lemgagrakul
() Pongthip Tameyabul

Issue Date : 19 January 2024

The Uncertainties are for a confidence probability of approximately 95 %.

This certificate may not be reproduced other than in full, used with the prior written approval of the head of Corporate Services & Equipment Calibration and Testing Services.



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2403-0563OC-3
Procedure Used : Calibration was 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.

Cert. No.: 24TM034
Page : 2 of 3

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1) Reference standard instrument: Instrument: MT57013711 ID No.: 23A1115 TPA Date Date: 11 Jul 2024

2) The 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.

Remarks : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration : (*) Without Adjustment

Function of UUC : Temperature Source

Fits as setting : Close

Environment during calibration

Position : (100) °C (104) °C

1 16-18TC-01 16-18RTD-01

2 16-18TC-02 16-18RTD-02

3 16-18TC-03 16-18RTD-03

4 16-18TC-04 16-18RTD-04

5 16-18TC-05 16-18RTD-05

6 16-18TC-06 16-18RTD-06

7 16-18TC-07 16-18RTD-07

8 16-18TC-08 16-18RTD-08

9 (ref.) 16-18TC-09 16-18RTD-09

Probe Installation Details : Dimension of Chamber : D = 0.40 m

W = 0.58 m

Capacity = 0.11 m³

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ghb-00127 Transverse view			Exposure No. 1087 Pitca Island, December 15, 1913, 12:45 AM	
Time	Exposure Rate	Acting Development	Type of Exposure	Optical Information
December 15, 1913 5:15 PM	8/4	Latent	Exposure No. 81 - Latent Exposure No. 82 - 1/2 Exposure No. 83 - 1/2 Exposure No. 84 - 1/2 Exposure No. 85 - 1/2	Part Count: 1
December 15, 1913 5:30 PM	8/4	Latent	Exposure No. 86 - 1/2 Exposure No. 87 - 1/2 Exposure No. 88 - 1/2 Exposure No. 89 - 1/2 Exposure No. 90 - 1/2	Exposure No. 86 - 1/2 Exposure No. 87 - 1/2 Exposure No. 88 - 1/2 Exposure No. 89 - 1/2 Exposure No. 90 - 1/2
December 15, 1913 6:07 PM	1/4	Latent	Exposure No. 91 - 1/2 Exposure No. 92 - 1/2 Exposure No. 93 - 1/2 Exposure No. 94 - 1/2 Exposure No. 95 - 1/2	None
December 15, 1913 6:22 PM	1/4	Latent	Exposure No. 96 - 1/2 Exposure No. 97 - 1/2 Exposure No. 98 - 1/2 Exposure No. 99 - 1/2 Exposure No. 100 - 1/2	None
December 15, 1913 6:35 PM	1/4	Latent	Exposure No. 101 - 1/2 Exposure No. 102 - 1/2 Exposure No. 103 - 1/2 Exposure No. 104 - 1/2 Exposure No. 105 - 1/2	None
December 15, 1913 6:50 PM	1/4	Latent	Exposure No. 106 - 1/2 Exposure No. 107 - 1/2 Exposure No. 108 - 1/2 Exposure No. 109 - 1/2 Exposure No. 110 - 1/2	None
December 15, 1913 7:05 PM	1/4	Latent	Exposure No. 111 - 1/2 Exposure No. 112 - 1/2 Exposure No. 113 - 1/2 Exposure No. 114 - 1/2 Exposure No. 115 - 1/2	None
December 15, 1913 7:20 PM	1/4	Latent	Exposure No. 116 - 1/2 Exposure No. 117 - 1/2 Exposure No. 118 - 1/2 Exposure No. 119 - 1/2 Exposure No. 120 - 1/2	None
December 15, 1913 7:35 PM	1/4	Latent	Exposure No. 121 - 1/2 Exposure No. 122 - 1/2 Exposure No. 123 - 1/2 Exposure No. 124 - 1/2 Exposure No. 125 - 1/2	None
December 15, 1913 7:50 PM	1/4	Latent	Exposure No. 126 - 1/2 Exposure No. 127 - 1/2 Exposure No. 128 - 1/2 Exposure No. 129 - 1/2 Exposure No. 130 - 1/2	None
December 15, 1913 8:05 PM	1/4	Latent	Exposure No. 131 - 1/2 Exposure No. 132 - 1/2 Exposure No. 133 - 1/2 Exposure No. 134 - 1/2 Exposure No. 135 - 1/2	None
December 15, 1913 8:20 PM	1/4	Latent	Exposure No. 136 - 1/2 Exposure No. 137 - 1/2 Exposure No. 138 - 1/2 Exposure No. 139 - 1/2 Exposure No. 140 - 1/2	None
December 15, 1913 8:35 PM	1/4	Latent	Exposure No. 141 - 1/2 Exposure No. 142 - 1/2 Exposure No. 143 - 1/2 Exposure No. 144 - 1/2 Exposure No. 145 - 1/2	None
December 15, 1913 8:50 PM	1/4	Latent	Exposure No. 146 - 1/2 Exposure No. 147 - 1/2 Exposure No. 148 - 1/2 Exposure No. 149 - 1/2 Exposure No. 150 - 1/2	None
December 15, 1913 9:05 PM	1/4	Latent	Exposure No. 151 - 1/2 Exposure No. 152 - 1/2 Exposure No. 153 - 1/2 Exposure No. 154 - 1/2 Exposure No. 155 - 1/2	None
December 15, 1913 9:20 PM	1/4	Latent	Exposure No. 156 - 1/2 Exposure No. 157 - 1/2 Exposure No. 158 - 1/2 Exposure No. 159 - 1/2 Exposure No. 160 - 1/2	None
December 15, 1913 9:35 PM	1/4	Latent	Exposure No. 161 - 1/2 Exposure No. 162 - 1/2 Exposure No. 163 - 1/2 Exposure No. 164 - 1/2 Exposure No. 165 - 1/2	None
December 15, 1913 9:50 PM	1/4	Latent	Exposure No. 166 - 1/2 Exposure No. 167 - 1/2 Exposure No. 168 - 1/2 Exposure No. 169 - 1/2 Exposure No. 170 - 1/2	None
December 15, 1913 10:05 PM	1/4	Latent	Exposure No. 171 - 1/2 Exposure No. 172 - 1/2 Exposure No. 173 - 1/2 Exposure No. 174 - 1/2 Exposure No. 175 - 1/2	None
December 15, 1913 10:20 PM	1/4	Latent	Exposure No. 176 - 1/2 Exposure No. 177 - 1/2 Exposure No. 178 - 1/2 Exposure No. 179 - 1/2 Exposure No. 180 - 1/2	None
December 15, 1913 10:35 PM	1/4	Latent	Exposure No. 181 - 1/2 Exposure No. 182 - 1/2 Exposure No. 183 - 1/2 Exposure No. 184 - 1/2 Exposure No. 185 - 1/2	None
December 15, 1913 10:50 PM	1/4	Latent	Exposure No. 186 - 1/2 Exposure No. 187 - 1/2 Exposure No. 188 - 1/2 Exposure No. 189 - 1/2 Exposure No. 190 - 1/2	None
December 15, 1913 11:05 PM	1/4	Latent	Exposure No. 191 - 1/2 Exposure No. 192 - 1/2 Exposure No. 193 - 1/2 Exposure No. 194 - 1/2 Exposure No. 195 - 1/2	None
December 15, 1913 11:20 PM	1/4	Latent	Exposure No. 196 - 1/2 Exposure No. 197 - 1/2 Exposure No. 198 - 1/2 Exposure No. 199 - 1/2 Exposure No. 200 - 1/2	None
December 15, 1913 11:35 PM	1/4	Latent	Exposure No. 201 - 1/2 Exposure No. 202 - 1/2 Exposure No. 203 - 1/2 Exposure No. 204 - 1/2 Exposure No. 205 - 1/2	None
December 15, 1913 11:50 PM	1/4	Latent	Exposure No. 206 - 1/2 Exposure No. 207 - 1/2 Exposure No. 208 - 1/2 Exposure No. 209 - 1/2 Exposure No. 210 - 1/2	None
December 15, 1913 12:05 AM	1/4	Latent	Exposure No. 211 - 1/2 Exposure No. 212 - 1/2 Exposure No. 213 - 1/2 Exposure No. 214 - 1/2 Exposure No. 215 - 1/2	None
December 15, 1913 12:20 AM	1/4	Latent	Exposure No. 216 - 1/2 Exposure No. 217 - 1/2 Exposure No. 218 - 1/2 Exposure No. 219 - 1/2 Exposure No. 220 - 1/2	None
December 15, 1913 12:35 AM	1/4	Latent	Exposure No. 221 - 1/2 Exposure No. 222 - 1/2 Exposure No. 223 - 1/2 Exposure No. 224 - 1/2 Exposure No. 225 - 1/2	None
December 15, 1913 12:50 AM	1/4	Lat		

Sartorius (Thailand) Co., Ltd. 501/502-503 Building, Nonthaburi, Bangkok 11120 Tel: 02-562-8991-4, e-mail: sartorius@thailand.com		 SARTORIUS LABORTECHNIK GERMANY 1922		REVIEW BY  APPROVED BY _____ _____	
<h1 style="text-align: center;">Certificate</h1> <h2 style="text-align: center;">of Calibration</h2>				NEXT CAL. DATE: 02/08/	
Client Name: <u>ANYLON-THAI CO.</u>		Client No.: <u>14057072</u>		Order No.: <u>Mastering, August 04, 2014</u>	
Location: <u>102/105554</u>		Reference No.: <u>348043</u>			
Serial Number: <u>027-0105554</u>					
Dr. No.: <u>BOL-UMED20</u>					
Material/Client: <u>Syringes</u>		Page No.: <u>1</u>		1 of 2	
Customer Name: <u>AL-Eximetry Group (Thailand) Co., Ltd.</u> <u>134 Phatthanaburi 60 Phatthanaburi Rd., Kwangjai Town Estg., Kiat Samsing Bangkok, 10216</u>					
Calibrated Item: <u>1x4 Syringe</u>					
Calibrated by: <u>Mr Chatchai Jitkham</u> Calibration Date: <u>Friday, August 01, 2014</u>					
Calibration Method: <u>None</u>					
Due Date: <u>27/0</u> Validity: <u>0.001%</u> \$					
Calibration Conditions: <u>Temperature: 23.6°C ± 0.4°C</u> <u>Humidity: 43.8% RH ± 2.0% RH</u> <u>Pressure: 1013.25 hPa ± 0.1 hPa</u>					
Equipment Condition: <u>Good</u> Accepted: <u>Yes</u> Not					
Measurements: <u>Method 1</u> Uncert: <u>Publication No. 14</u>					
<p>The measurement uncertainty stated is the expanded uncertainty which is determined from the stated uncertainty multiplied by the coverage factor k=2 to provide a level of confidence of approximately 95%. It is expressed in accordance with the Guide to Expression of Uncertainty in Measurement. The calibration certificate assessment has transparency in National Standards, which reflect the state of measurement achieved at the International System of Units (SI). Request of tolerance comes from the list of Sartorius Measurement Specifications.</p>					
Traceability:					
Weight Standard: <u>Uncertainty</u>		Traceability: <u>Coarse No. 1</u>		Due Date: <u>31-Aug-15</u>	
Weight Standard: <u>Uncertainty</u>		Traceability: <u>Yes</u>		Due Date: <u>31-Aug-15</u>	

Serstaris (Thailand) Co., Ltd. 101-101-101-101 101-101-101-101 101-101-101-101		 SERSTARIS MEDICALS ENTERPRISE CORPORATION LTD. 101-101-101-101		REVIEW by <u>Jude K</u> APPROVED by <u>Link P</u> NEXT CAL DATE: <u>02/08/25</u>																
<h1 style="margin: 0;">Certificate</h1> <h2 style="margin: 0;">of Calibration</h2>																				
Main Item(s): <u>MVZVT-100-CU</u>			Certificate No.: <u>MSCT070</u>																	
Description: <u>Analytical Balance</u>			Issued Date: <u>Hongkong August 05, 2024</u>																	
Serial Number: <u>007100066</u>			Influence No.: <u>NA0003</u>																	
Lot ID: <u>MSL_000070</u>			Exp. No.: <u>1387</u>																	
Manufacturer: <u>Sartorius</u>																				
Customer name: <u>AS Laboratory Group (Thailand)Co., Ltd.</u> <u>134 Phramunwong Rd Phramunwong, Muang, Chonburi Town, Chonburi, Thailand</u>																				
Calibration Place: <u>L.A. Home</u>																				
Calibrated By: <u>Ms Chen Jia Yufeng</u>																				
Calibration Date: <u>Friday, August 02, 2024</u>																				
Measurement (UKAS Publication Ref Lab 14)																				
<p>The measurement uncertainty stated in the expanded uncertainty which is calculated from the standard uncertainty multiplied by the coverage factor k=2, provides a level of confidence of approximately 95%. It is determined as accordance with the Guide to Expression of Uncertainty in Measurement (GUM). The calibration certificate documents the conformity to National Standards, which utilize the unit of measurement according to the International System of Units (SI). Report of Customer Name, Name of Serstaris Medical Products Specifications.</p>																				
Toleranceability																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Model Number</th> <th>Description</th> <th>Uncertainty</th> <th>Certificate No.</th> <th>Due Date</th> </tr> </thead> <tbody> <tr> <td>VF2011-102-00</td> <td>Temperature probe set, 100g x 0.01mg x 0.01 mm</td> <td>YES</td> <td>MSCT000195</td> <td>21-Aug-2024</td> </tr> <tr> <td>Scale 12A-M</td> <td>Non-destructive, X-ray Check</td> <td>NO/OK</td> <td>NET 001-303(01)140</td> <td>13-Nov-2024</td> </tr> </tbody> </table>						Model Number	Description	Uncertainty	Certificate No.	Due Date	VF2011-102-00	Temperature probe set, 100g x 0.01mg x 0.01 mm	YES	MSCT000195	21-Aug-2024	Scale 12A-M	Non-destructive, X-ray Check	NO/OK	NET 001-303(01)140	13-Nov-2024
Model Number	Description	Uncertainty	Certificate No.	Due Date																
VF2011-102-00	Temperature probe set, 100g x 0.01mg x 0.01 mm	YES	MSCT000195	21-Aug-2024																
Scale 12A-M	Non-destructive, X-ray Check	NO/OK	NET 001-303(01)140	13-Nov-2024																
<p>This certificate valid and apply the requirement.</p> <p>No certificate may be reprinted after it has full stamp with the given setting against the Verification Certificate Scheme (Thailand) Co., Ltd.</p>																				
Malaysia Industrial Calibration Standard																				

Sartorius (Thailand) Co., Ltd.
 Certificate of Calibration

SARTORIUS

Model/Version: A1004-G, 1004-G
 Description: Analytical Balance
 Serial Number: 80740998
 ID No.: 80740998
 Manufacturer: Sartorius

Calibration Results : Without Adjustment

Repeatability

Linearity

Uncertainty

Calibration Results : Without Adjustment

Repeatability

Linearity

Uncertainty

SCG Metrology
 SCI ECO Services Company Limited
 33/2 Moo 3, T. Bangpa, A. Kaengkhro, Samut Prakan 10110, Thailand
 Bangkok Tel : +66 8257 5096 Fax : +66 8257 3100
 Website : www.sci-eco.co.th E-Mail : cal@sci-eco.co.th

SCG Metrology
 SCI ECO Services Company Limited
 33/2 Moo 3, T. Bangpa, A. Kaengkhro, Samut Prakan 10110, Thailand

Certificate No. T24994 Page 1 of 3

Certificate of Calibration

Equipment : Chamber (Oven)
 Manufacturer : Memmert
 Model : UF 450
 Serial No. : B717.0531
 Customer Code : BKK_EN0273
 ID No. : T804244
 Customer : ALS Laboratory Group (Thailand) Co., Ltd.
 104 Phantabanan 40, Phantabanan Rd., Khwaeng Phantabanan,
 Khet Suan Luang, Bangkok 10250
 Customer Location : Laboratory (Oven Room)
 Date of Receipt : 08 May 2024
 Calibrated By : Preecha Phichasuthikul (Temperature Calibration Manager)
 Approved By : / Nuanun Sungchum (Metrology Manager)
 Date of Issue : 13 May 2024

Certificate No. T24994 Page 2 of 3

Calibration Report

Equipment : Chamber (Oven)
 Date of Calibration : 14 May 2024
 Environment : Temperature : 26.5-28.1 °C
 Line Voltage : 226.7-229.8 V
 Relative Humidity : 51-57 %RH

Condition of this result of calibration :

1. This equipment was calibrated by using four resistance thermometers located in chamber, the value one resistance thermometer detector use for ambient temperature measurement. The calibration was done in accordance to WI-T10 (based on ASTM E149-04 (Reapproved 2001) and AS231-1996). All data show below were final values and the initial data from customer request. The temperature scale used was based on ITS-90.

2. Reference Standard Instrument :

3. This certificate is traceable to National Institute of Metrology (Thailand) through Metrological Center (NSC-TSI-TS17025 CALIBRATION 0244).

4. Condition of calibrated item : good

Equipment Description :

Time Constant : Hour 30 Minute 45 Second 154 °C
 Fresh Air Damper : ☒ Open ☐ Close ☐ Medium ☐ Max

5. Adjustment : (X) without adjustment () after adjustment

Approved By : /

SCG Metrology
 SCI ECO Services Company Limited
 33/2 Moo 3, T. Bangpa, A. Kaengkhro, Samut Prakan 10110, Thailand

Certificate No. T40904 Page 3 of 3

Calibration Report

Equipment : Chamber (Oven)
 Manufacturer : Carbolite
 Model : CWF 11/23
 Serial No. : 21-201100
 Customer Code : BKK_FL0019
 ID No. : T409043
 Customer : ALS Laboratory Group (Thailand) Co., Ltd.
 104 Phantabanan 40, Phantabanan Rd., Khwaeng Phantabanan,
 Khet Suan Luang, Bangkok 10250
 Customer Location : Oven Room
 Date of Receipt : 27 June 2023
 Calibrated By : Sujar Nakaekred (Site Calibration Manager)
 Approved By : / Boonchai Suriyawang (Site Calibration Manager)
 Date of Issue : 11 Jul 2023

Condition of this result of calibration :

1. This equipment was calibrated by using four standard thermocouples type S inside the chamber, the other one thermocouple type T used for ambient temperature measurement. The calibration was done in accordance to WI-T10 (based on ASTM E149-04 (Reapproved 2001) and AS231-1996). All data show below were final values and the initial data from customer request. The temperature scale used was based on ITS-90.

2. Reference Standard Instrument :

3. This certificate is traceable to National Institute of Metrology (Thailand) through Metrological Center (NSC-TSI-TS17025 CALIBRATION 0244).

4. Condition of calibrated item : good

Equipment Description :

Time Constant : Hour 38 Minute 45 Second 500 °C
 Fresh Air Damper : ☐ Open ☐ Min ☐ Medium ☐ Max

5. Adjustment : () without adjustment (X) after adjustment

Approved By : /

SCG Metrology
 SCI ECO Services Company Limited
 33/2 Moo 3, T. Bangpa, A. Kaengkhro, Samut Prakan 10110, Thailand
 Bangkok Tel : +66 8257 5096 Fax : +66 8257 3100
 Website : www.sci-eco.co.th E-Mail : cal@sci-eco.co.th

Certificate No. T23104 Page 1 of 2

Certificate of Calibration

Equipment : Furnace
 Manufacturer : Carbolite
 Model : CWF 11/23
 Serial No. : 21-201100
 Customer Code : BKK_FL0019
 ID No. : T409043
 Customer : ALS Laboratory Group (Thailand) Co., Ltd.
 104 Phantabanan 40, Phantabanan Rd., Khwaeng Phantabanan,
 Khet Suan Luang, Bangkok 10250
 Customer Location : Oven Room
 Date of Receipt : 27 June 2023
 Calibrated By : Sujar Nakaekred (Site Calibration Manager)
 Approved By : / Boonchai Suriyawang (Site Calibration Manager)
 Date of Issue : 11 Jul 2023

Condition of this result of calibration :

1. This equipment was calibrated by using four standard thermocouples type S inside the chamber, the other one thermocouple type T used for ambient temperature measurement. The calibration was done in accordance to WI-T10 (based on ASTM E149-04 (Reapproved 2001) and AS231-1996). All data show below were final values and the initial data from customer request. The temperature scale used was based on ITS-90.

2. Reference Standard Instrument :

3. This certificate is traceable to National Institute of Metrology (Thailand) through Metrological Center (NSC-TSI-TS17025 CALIBRATION 0244).

4. Condition of calibrated item : good

Equipment Description :

Time Constant : Hour 38 Minute 45 Second 500 °C
 Fresh Air Damper : ☐ Open ☐ Min ☐ Medium ☐ Max

5. Adjustment : () without adjustment (X) after adjustment

Approved By : /

SCG Metrology
 SCI ECO Services Company Limited
 33/2 Moo 3, T. Bangpa, A. Kaengkhro, Samut Prakan 10110, Thailand

Certificate No. T23104 Page 2 of 3

Calibration Report

Equipment : Furnace
 Date of Calibration : 4 July 2023
 Environment : Temperature : 27.1-28.5 °C
 Line Voltage : 221.6-224.1 V
 Relative Humidity : 55-65 %RH

Condition of this result of calibration :

1. This equipment was calibrated by using four standard thermocouples type S inside the chamber, the other one thermocouple type T used for ambient temperature measurement. The calibration was done in accordance to WI-T10 (based on ASTM E149-04 (Reapproved 2001) and AS231-1996). All data show below were final values and the initial data from customer request. The temperature scale used was based on ITS-90.

2. Reference Standard Instrument :

3. This certificate is traceable to National Institute of Metrology (Thailand) through Metrological Center (NSC-TSI-TS17025 CALIBRATION 0244).

4. Condition of calibrated item : good

Equipment Description :

Time Constant : Hour 38 Minute 45 Second 500 °C
 Fresh Air Damper : ☐ Open ☐ Min ☐ Medium ☐ Max

5. Adjustment : () without adjustment (X) after adjustment

Approved By : /

SCG Metrology
 SCI ECO Services Company Limited
 33/2 Moo 3, T. Bangpa, A. Kaengkhro, Samut Prakan 10110, Thailand

Certificate No. T23104 Page 3 of 3

Calibration Report

Equipment : Furnace
 Manufacturer : Carbolite
 Model : CWF 11/23
 Serial No. : 21-201100
 Customer Code : BKK_FL0019
 ID No. : T409043
 Customer : ALS Laboratory Group (Thailand) Co., Ltd.
 104 Phantabanan 40, Phantabanan Rd., Khwaeng Phantabanan,
 Khet Suan Luang, Bangkok 10250
 Customer Location : Oven Room
 Date of Receipt : 27 June 2023
 Calibrated By : Sujar Nakaekred (Site Calibration Manager)
 Approved By : / Boonchai Suriyawang (Site Calibration Manager)
 Date of Issue : 11 Jul 2023

Condition of this result of calibration :

1. This equipment was calibrated by using four standard thermocouples type S inside the chamber, the other one thermocouple type T used for ambient temperature measurement. The calibration was done in accordance to WI-T10 (based on ASTM E149-04 (Reapproved 2001) and AS231-1996). All data show below were final values and the initial data from customer request. The temperature scale used was based on ITS-90.

2. Reference Standard Instrument :

3. This certificate is traceable to National Institute of Metrology (Thailand) through Metrological Center (NSC-TSI-TS17025 CALIBRATION 0244).

4. Condition of calibrated item : good

Equipment Description :

Time Constant : Hour 38 Minute 45 Second 500 °C
 Fresh Air Damper : ☐ Open ☐ Min ☐ Medium ☐ Max

5. Adjustment : () without adjustment (X) after adjustment

Approved By : /

ET บริษัท เอกเสควิทีพี เทคโนโลยี จำกัด (มหาชน)
 40/184-5 ถนนพหลโยธิน แขวงสามยุค กรุงเทพมหานคร 10230
 TEL: 02-515 0145-50 FAX: 02-515 0144 www.etm.com E-mail: info@etm.com

Certificate of Calibration

Customer : ALS Laboratory Group (Thailand) Co., Ltd.
 Address : 104 Phantabanan 40, Phantabanan Rd., Khwaeng Phantabanan, Khet Suan Luang, Bangkok 10250
 Calibration location : Executive Trading Limited
 Address : 48/184-5 ถนนพหลโยธิน แขวงสามยุค กรุงเทพมหานคร 10230

Tools :

Instrument : Gas Detector
 Product : RAI Systems
 Model Name : MIRA3000
 Serial Number : 592 911239
 ID : BKK_F50621

Date of Calibration : August 25, 2023
 Calibration Method : This instrument has been calibrated using calibration gases. Test and calibration data is on file with Executive Trading Limited.
 Reference Standard : Laboratory Standard Gas 100 ppm, Lot number: 302-021431806

Flow Rate of Pump : 476 cc/min
 Accuracy : $\pm 3\%$ at calibration point

Calibrated By : / Approved By : /

ET บริษัท เอกเสควิทีพี เทคโนโลยี จำกัด (มหาชน)
 40/184-5 ถนนพหลโยธิน แขวงสามยุค กรุงเทพมหานคร 10230
 TEL: 02-515 0145-50 FAX: 02-515 0144 www.etm.com E-mail: info@etm.com

Certificate of Calibration

Customer : ALS Laboratory Group (Thailand) Co., Ltd.
 Address : 104 Phantabanan 40, Phantabanan Rd., Khwaeng Phantabanan, Khet Suan Luang, Bangkok 10250
 Calibration location : Executive Trading Limited
 Address : 48/184-5 ถนนพหลโยธิน แขวงสามยุค กรุงเทพมหานคร 10230

Tools :

Instrument : Gas Detector
 Product : RAI Systems
 Model Name : MIRA3000
 Serial Number : 592 911239
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Calibrated By : / Approved By : /



บริษัท เอ็กสเคคิวทีฟเทรดดิ้ง จำกัด (ส่วนประกอบ)
48/184-5 ซอยประชาชื่น 18 แขวงปทุมวัน เขตปทุมวัน กรุงเทพฯ 10230
TEL (662) 515-0145-50 FAX (662) 515-0144 www.etthai.com E-mail: info@etthai.com



CALGAZ
A DIVISION OF AIRGAS USA LLC
821 Chesapeake Drive,
Cambridge, MD 21613
USA Tel: 1-800-438-3197
www.calgaz.com

Honeywell

Form 401-01 (Rev. 1-15-2015) (P.1)
17 Chang Boreas Park Road, 1
Singapore 48711
Contact: 4888

ใบรายงานการตรวจเช็คเครื่องตรวจวัดก๊าซ รุ่น M161RAE3000

หมายเลขเครื่อง: 592 911239

วันที่ตรวจเช็ค: 25 สิงหาคม 2566

ลำดับที่	รายการตรวจ	RAW COUNT		สรุป	หมายเหตุ
		REF	REAL		
1.	PID RAW COUNT				
	CELN	10000-42500	48755	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	CLL	<42500	52232	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
2.	Lamp	>40	50	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
3.	Motor Pump	Check flow rate		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	47% flow
4.	Buzzer			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
5.	Li-ion Battery			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
6.	Key Pad			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
7.	Y-			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
8.	NA-			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
9.	MODE			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
10.	LCD Display			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
11.	TiP sensor			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
12.	Light Sensor			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
13.	Prodat Clip			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
14.	PC Port			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
15.	Slam Rubber Boot			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	

ผู้ตรวจ

(นายสุรินทร์ ชานนตรี)

Service Engineer

CERTIFICATE OF ANALYSIS

Date: 06/08/2022
Order Number: 1110821862
Lot Number: 302-402431506

Customer: EXECUTIVE TRADING LIMITED
Part Number: 600-0002-000
Use Before: JUN 8, 2027

Component	Concentration (± 2%)
ISOBUTYLENE	100PPM
AIR	Balanced

Cylinder Size: 1.2 Cu. Ft.
Contents: 34 Lb.

Valve: CGA800
Pressure: 494 PSIG

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

Analyst:

(Chris Donnelly)

Chris Donnelly

CERTIFICATE of Attendance

It is hereby certified that

Mr. Surinthon Saingte
(Executive Trading Limited)

has successfully completed the

RAE Service Training Course

Conducted by

HONEYWELL

on 2nd August 2022

Conducted by: Desmond Tan
Service Engineer / Technical Trainer
Date of Issue: 04th August 2022
Certificate valid for 2 years from date of issue

ภาคผนวก จ

หนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
จากกรมโรงงานอุตสาหกรรม

ที่ อก ๐๓๑๐(๑)/ ๑ ๖ ๑ ๖ ๘



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒ ๐ พฤศจิกายน ๒๕๖๖

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๔ สิงหาคม ๒๕๖๖

สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น

๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ แผ่น

๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐
ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด
ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย ตามสิ่งที่ส่งมาด้วย ๑

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ ๑๘๑ ราย ตามสิ่งที่ส่งมาด้วย ๒

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย สิ่งปฏิกูล
หรือวัสดุที่ไม่ใช่แล้ว และดิน ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ กันยายน ๒๕๖๙ หากประสงค์จะต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อ
กรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศิระ จันทร์เจ็ด)

นักวิทยาศาสตร์เชี่ยวชาญ วิชาการการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๕๕

ไปรษณีย์อิเล็กทรอนิกส์ saraban@dlw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/ ๑ ๖ ๑ ๖ ๘

ลงวันที่ ๒ ๐ พฤศจิกายน ๒๕๖๖

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย

๑) นางสาวยุพาพร จันทร์เปล่ง

ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๑

๒) นางสาวชนัญ โคมารกุล ณ นคร

ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๒

๓) นายศรายุทธ จิตรานนท์

ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๓

๔) นางสาวกนกกร เอนก

ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๔

๕) นายสุริยา สอนแก้ว

ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๕

๖) นายวิชาญ ขุนหรีด

ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๖

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔
ที่ อก ๐๓๑๐(๑)/ ๑ ๖ ๑ ๖ ๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๘๑ ราย

๑) นายกาญจน์จิต กิตติคุณนิษฐ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๑
๒) นายภัทรพล สว่างใจธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๒
๓) นายณราธิป เทือกชัยคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๓
๔) นายศิริโชค พงษ์ประสม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๔
๕) นายณัฐวุฒิ ดั่งแพง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๕
๖) นางสาวจินดา โชกุลธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๖
๗) นางสาวสาวิตรี น้อยเสียม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๗
๘) นางสาวชนัญญาญจน์ อิมขม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๘
๙) นางสาวนรินทร์ สายเส็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๙
๑๐) นางสาวนันทวดี สมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๐
๑๑) นางสาวศรีธยา เฉลิมธำรงค์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๑
๑๒) นางสาวธัญญธร มงคลจิรวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๒
๑๓) นางสาวศิริลักษณ์ บุณนาค	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๓
๑๔) นายนพพงศ์ จันทร์พันธุ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๔
๑๕) นายนรเศรษฐ์ โกมลาลัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๕
๑๖) นายธันวรา จริยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๖
๑๗) นางสาวเกศรินทร์ แก้วมัน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๗
๑๘) นางสาวสุวิมล ชัยเรืองวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๘
๑๙) นางสาวสุชาดา ธรรมถาวร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๙
๒๐) นางสาวเปมิกา ชัยเดชธนกุล	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๐
๒๑) นางสาวศศิธร หมูสวัสดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๑
๒๒) นางสาวเสาวลักษณ์ ภูณาทำพร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๒
๒๓) นายอภิสิทธิ์ สิงหา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๓
๒๔) นายศักดิ์สิทธิ์ โพธิ์สาธุสิทธิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๔
๒๕) ว่าที่ร้อยตรีหญิง พรณิภา ขำเจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๕
๒๖) นางจิตตา คำภูแก้ว	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๖
๒๗) นางสาวอรรณพ รักยาง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๗
๒๘) นางสาวนพรัตน์ แยมกรานต์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๘
๒๙) นายจุลเดช วารินทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๙
๓๐) นางสาวดาญรัตน์ ร้องคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๐
๓๑) นายพรมมี ศรีปัดเนตร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๑
๓๒) นายอุทิศ อุ่นส้ม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๒
๓๓) ว่าที่ร้อยตรี เฉลิมเกียรติ อมรศรีเสริม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๓
๓๔) นางสาววริยา สว่างนา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๔
๓๕) นายอนุพงศ์ รัตนศรีประเสริฐ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๕

วิทย์

๓๖) นางสาวจุฑารัตน์...

๓๖) นางสาวจุฑารัตน์ โอนสันเทียะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๖
๓๗) นางสาวจากรุวรรณ พิมพ์ภักดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๗
๓๘) นางสาวปรางค์ทิพย์ กิจไพศาลศักดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๘
๓๙) นางสาวเดือนใจ ทางกลาง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๙
๔๐) นางสาวจิราพร ศิริเวช	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๐
๔๑) นายวรกร ผู้กรักษ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๑
๔๒) นายทอง วิริยะสทกิจ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๒
๔๓) นายธนิศ เจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๓
๔๔) นายคณิศร ข้าเพชร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๔
๔๕) นายภูวิช พรหมสะอาด	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๕
๔๖) นายธนเดช โภคาพิพัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๖
๔๗) นายชวฤทธิ์ วงษ์จันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๗
๔๘) นายอาทิตย์ ศรีเสน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๘
๔๙) นายเชดินทร์ คงศักดิ์ไทย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๙
๕๐) นายจรัส บุญย้ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๐
๕๑) นายธนาณัติ เอนก	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๑
๕๒) นายอภิวัฒน์ ทุมหนู	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๒
๕๓) นางสาวสุภาวัญ มาก	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๓
๕๔) นางสาวทัศนพร ขวาลสมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๔
๕๕) นางสาววิติมา บุญเพ็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๕
๕๖) นางสาวภาณุมาศ นามวัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๖
๕๗) นางสาวอุไรรัตน์ ทั้งสร้างแป้น	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๗
๕๘) นายธีรวัฒน์ ปวงสุข	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๘
๕๙) นายอิทธิพล ยะโส	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๙
๖๐) นายประพนธ์ วรรณชูชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๐
๖๑) นายชยธร พวงทิพย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๑
๖๒) นางสาวกนกวรรณ จันทร์บาล	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๒
๖๓) นายสิทธิโชค ธงเงิน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๓
๖๔) นางสาววรรณใจ บุญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๔
๖๕) นางสาวพรพรณิศา ทุมคง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๕
๖๖) นายณวกัฏฐ์ ศรีวิริยะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๖
๖๗) นายสุวิชา ทองอ่อน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๗
๖๘) นายวิญญู บุญตะนัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๘
๖๙) นายสมบูรณ์ บุตรจันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๙
๗๐) นายวิรัตน์ ไชยชนะรา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๐
๗๑) นายณนุชพันธ์ เพิ่มพูน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๑
๗๒) นายจิรณัฐ ขาวละออ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๒
๗๓) นายอัสนี นามบุรี	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๓
๗๔) นายอัศวิน จ่อสาว	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๔

วิทย์

๗๕) นายประเสริฐ...

๗๕) นายประเสริฐ สุระขันธุ์
๗๖) นายบุญกุล จันทร์เนียม
๗๗) นายพิรพงษ์ ทองคุณปรีดา
๗๘) นายณฤพล ทองบุษ
๗๙) นายอนุวัฒน์ ม่วงแพ
๘๐) นายเจตศราวุฒิ ปัตตะมะ
๘๑) นายกฤษณะ สายวรรณ
๘๒) นายพิชัย บุญยงค์
๘๓) นายภาณุพงศ์ โยมวงศ์
๘๔) นายสามารถ คู่มป्ली
๘๕) นายสัญญาชัย โกศรีนาม
๘๖) นายณัฐวุฒิ ศรีประเสริฐ
๘๗) นายชวัลลภ นาคพนม
๘๘) นายพงศธร ชัยทิพย์
๘๙) นายสิทธิโชค ทาสีดา
๙๐) นายธนากร อินสุตา
๙๑) นางสาววรรณิษา ขาติวันชัย
๙๒) นางสาวพิมพ์ตะวัน มินากุล
๙๓) นางสาวเพชรรัตน์ สิงห์สมบุญ
๙๔) นางสาวชญานิษฐ์ พรหมจันทร์
๙๕) นายกักริต ทวีราช
๙๖) นายจักริน หมั่นวิชา
๙๗) นายฉัตรชัย สุขเปี้ย
๙๘) นายณรรณท์ ต๊ะทองคำ
๙๙) นายศุภพล สมนอก
๑๐๐) นายทักษ์ดนัย อุบลศรี
๑๐๑) นายธนศวรร นามะกุลณ
๑๐๒) นายธิตติพงษ์ บัวแดง
๑๐๓) นายณนทชัย อุปถัมภ์
๑๐๔) นายรัฐพล คุณสุทธิ
๑๐๕) นายณันทวัฒน์ สาริน
๑๐๖) นายปิยะนัฐ พลมะศรี
๑๐๗) นายพงศ์สิริ โสมเขียว
๑๐๘) นายพิรพัฒน์ กำคำ
๑๐๙) นายภาณุพงศ์ มาปิตย์
๑๑๐) นายมงคล ผลาทิพย์
๑๑๑) นายสิรินันท์ ทองอิน
๑๑๒) นายอนุชา หันสมัย
๑๑๓) นายอดิศักดิ์ ผะโ

ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๕
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วิมล

๑๑๔) นายอนันตชัย...

๑๑๔) นายอนันตชัย วิสม
๑๑๕) นายวราวุธ ดีนัก
๑๑๖) นายแสตวัน นทะสัด
๑๑๗) นายยุทธพงศ์ รัตนะ
๑๑๘) นายชัยวุฒิ ไชยชนะ
๑๑๙) นายวิศรุต ศรีธรรมมา
๑๒๐) นายณนทกร เมื่อกม
๑๒๑) นายคำชัย สุทธะ
๑๒๒) นางสาวณัฐภรณ์ บุญตะนัย
๑๒๓) นางสาวพัชรินทร์ แสนสร้อย
๑๒๔) นายไพโรจน์ เปี่ยมพิมาย
๑๒๕) นางสาวศุภมาส ทองมาก
๑๒๖) นางสาวลลิตา จิตรสว่าง
๑๒๗) นางสาวชไมพร เล็กภูเขียว
๑๒๘) นางสาวกฤติมาพร คำมีแก่น
๑๒๙) นางสาวสกุลรัตน์ ภาควิม
๑๓๐) นางสาวไพรินทร์ ศรีรูป
๑๓๑) นางสาวทิพนตร ชาญปัญญา
๑๓๒) นางสาวสาธิตา ปานทอง
๑๓๓) นางสาวอริสา ทองนวล
๑๓๔) นางสาวอรรษา คำคล่อง
๑๓๕) นางสาวชุตติภรณ์ สุนทรสนาน
๑๓๖) นางสาวอัญชลี คำจันทร์
๑๓๗) นายบุญฤทธิ์ เอี่ยมเทศ
๑๓๘) นางสาวศุภรดา ปันมยุรา
๑๓๙) นางสาวพาดุติ คุณนาน
๑๔๐) นางสาวจิราเจต พองดา
๑๔๑) นางสาวอารยา มีชัย
๑๔๒) นางสาววิษุตา นาคผจญ
๑๔๓) นางสาวนันทยา จันทะลุน
๑๔๔) นายกิตติพงษ์ แซ่ลี
๑๔๕) นายอนุวัติ ภูถวิล
๑๔๖) นายธีรพล แสงทอง
๑๔๗) นายศักดิ์พัฒน์ บุญมัน
๑๔๘) นายฐิตวิธย์ เอมอุไร
๑๔๙) นายชัยณรงค์ ศรีบุรินทร์
๑๕๐) นางสาวอัจฉราวรรณ สอนสนอง
๑๕๑) นางสาวณัฐพร สิงหา
๑๕๒) นายกัมเรศ แหยมโต

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ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๒

วิมล

๑๕๓) นางสาวอุบล...

- ๕ -

๑๕๓) นางสาวอุบล เคิกศิริ
๑๕๔) นางสาวมโนรัตน์ ทองบุตร
๑๕๕) นายภาคภูมิ แพนไทย
๑๕๖) นางสาวสุภาณัฐ เมลล์พวง
๑๕๗) นางสาวพรทิศา สาดาชนม์
๑๕๘) นายเอกวิทย์ วันทะนา
๑๕๙) นายไตรมณฑล ทิพย์วรรณ
๑๖๐) นายจิรเมธ ประเสริฐศิริพงศ์
๑๖๑) นายจิรายุส เกษมสุข
๑๖๒) นายจิรศักดิ์ ศรีวิชัย
๑๖๓) นายณัฐกฤษณ์ สะพานแก้ว
๑๖๔) นายบุญณศักดิ์ ปะที
๑๖๕) นายปณณวิทย์ เสมอทรัพย์
๑๖๖) นายพิษณุพงษ์ ไชยา
๑๖๗) นายภัทรพงษ์ มณฑาทอง
๑๖๘) นายวสันต์ ตรีนกุล
๑๖๙) นายภาณุเดช เพชรอุด
๑๗๐) นายอนุกุล วิริยะแสง
๑๗๑) นายภัทรพงษ์ มีสุข
๑๗๒) นางสาวนุชรี ลีละทีป
๑๗๓) นางสาวสุภาวดี โกศรีนาม
๑๗๔) นางสาวอรณิชา เขียนคำ
๑๗๕) นางสาวพรเพ็ญ ขอบสอน
๑๗๖) นางสาววันวิสา ขอนพิกุล
๑๗๗) นางสาวอรรพรรณ เถาว์ทอง
๑๗๘) นางสาวอัยย์สิน เมอร์วินณ์
๑๗๙) นางสาววิสา คุ้มครอง
๑๘๐) นายวุฒิกร ศิริวรรณ
๑๘๑) นางสาวจรรวรรณ กระจำพันธุ์

ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๕๓
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วิทย์

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๒๐๔
ที่อก ๐๓๑๐(๑)/ ๑ ๖ ๑ ๖ ๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๗๔ รายการ

น้ำเสีย จำนวน 60 รายการ

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

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 ⁽⁴⁾ 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⁾

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 ⁽⁴⁾
50	Phenols	1) Distillation, Chloroform Extraction Method ⁽⁴⁾ 2) Distillation, Direct Photometric Method ⁽⁴⁾
51	Selenium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
52	Sulfide	Iodometric Method ⁽⁴⁾
53	Temperature	Laboratory and Field Methods ⁽⁴⁾
54	Total Dissolved Solids	Dried at 180 °C ⁽⁴⁾
55	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method ⁽⁴⁾
56	Total 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 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	สารมลพิษ	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⁾

ลำดับที่	สารมลพิษ	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⁾

ลำดับที่	สารมลพิษ	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-Methylnapthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
90	Methyl tert-butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
91	Napthalene	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]

ลำดับที่	สารมลพิษ	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 ₅ -C ₈)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,25]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
110	TPH (C ₈ -C ₁₆)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[9,22]
111	TPH (C ₁₆ -C ₃₅)	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]

อากาศเสีย (ปล่องระบาย) 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) Absorption 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) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
13	Hydrogen Fluoride	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[5]

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 ^[2]
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]

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว 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 ^[10,26] 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,26]
2	Antimony	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]
3	Arsenic	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]
4	Barium	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]

5 Beryllium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
5	Beryllium	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)
6	Cadmium	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)
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
8	Chromium	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)
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 ^(7,8,16,19) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7,8,17,19)

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^(1,6,19) 2) Alkaline Digestion, Colorimetric Method ^(8,19)
11	Cobalt	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)
12	Copper	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)
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 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 ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 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 ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 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 ^(1,9,26)

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26) 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 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 ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 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 ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
20	Lead	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)
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

ลำดับที่	สารมลพิษ	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 ^(1,6,30) 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽²⁰⁾ 4) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽³⁰⁾ 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 ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 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 ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic /Mass Spectrometric Method ^(11,26)
25	Molybdenum	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)
26	Nickel	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)
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 ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(11,26)

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 ^(1,9,26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26) Electrometric Method ^(23,24)
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 ^(1,9,26) 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)

ดิน...

ดิน 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⁾
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) <i>3m</i>

11 Benzo(b)fluoranthene

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Benzo(b)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
12	Benzo(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	Benzo(a)pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
15	Benzo(g,h,i)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 ^(13,25)
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) <i>3m</i>

23 Cadmium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^[7,16] 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 ^[15,25]
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[15,25]
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 ^[15,25]
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[15,25]
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[15,25]
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 ^[7,16] 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]

ลำดับที่	สารมลพิษ	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 ^[15,25]
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[15,25]
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[15,25]
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 ^[15,25]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
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 ^(15,25)
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
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	สารมลพิษ	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 ^(15,25)
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 ^(15,25)
73	n-Hexane	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25) 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 ⁽³⁰⁾

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25) 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^(13,25)
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 ^(15,25)
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
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 ^(15,25)
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)

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',3,4,4',5,6-Heptachlorobiphenyl - 2,2',3,4',5,5',6-Heptachlorobiphenyl - 2,2',3,3',4,4',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)

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 ^(15,25)
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
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 ^(15,25)
109	TPH (C ₈ -C ₁₆)	1) Automate Extraction, Gas Chromatographic Method ^(11,22) 2) Solvent Extraction, Gas Chromatographic Method ^(12,22) 3) Ultrasonic Extraction, Gas Chromatographic Method ^(22,31)
110	TPH (C ₁₆ -C ₃₅)	1) Automate Extraction, Gas Chromatographic Method ^(11,22) 2) Solvent Extraction, Gas Chromatographic Method ^(12,22) 3) Ultrasonic Extraction, Gas Chromatographic Method ^(22,31)
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
115	2,4,5-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
116	2,4,6-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
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 ^(15,25)
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
121	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
122	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
123	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
125	Zinc	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)

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วิมล



ที่ อก ๐๓๑๐(๑)/ ๔ ๑ ๒ ๑

กรมโรงงานอุตสาหกรรม
ถนนพหลโยธินที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๕ เมษายน ๒๕๖๗

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขณิฉารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๔ มีนาคม ๒๕๖๗

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ
เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้อยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓ ราย

- | | |
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| ๑) นางสาวพรณิศา พุ่มคง | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๕ |
| ๒) นายกำชัย สุทธิระ | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๑ |
| ๓) นางสาวศุภรดา ปันมยุรา | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๘ |

๒. ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๑๒ ราย

- | | |
|-----------------------------|----------------------------|
| ๑) นางสาวฐานิดา กลิ่นเขียว | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๒ |
| ๒) นางสาวกัญญ์ภัสสร สายคำ | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๓ |
| ๓) นางสาวณัฐนันท์ กันทะวงศ์ | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๔ |
| ๔) นายอำนาจ วงษาเคน | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๕ |
| ๕) นายภุชฌณพล ปัญญาวงศ์ | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๖ |
| ๖) นายณชากร ทรรษา | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๗ |
| ๗) นายวัชรินทร์ ผ่องสามสวน | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๘ |
| ๘) นายณัฐพงศ์ โสภา | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๙ |
| ๙) นายศักรินทร์ ปานเพ็ง | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๙๐ |
| ๑๐) นายณัฐพล ชุ่มชื่น | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๙๑ |
| ๑๑) นายธนา สุพาพันธุ์ | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๙๒ |
| ๑๒) นายนราธร แก้วพงษ์ษา | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๙๓ |

อนึ่ง หนังสือฉบับนี้...

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒ กันยายน ๒๕๖๙

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

ท

(นายพรยศ กลั่นกรอง)

รองอธิบดี ปฏิบัติราชการแทน

อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๕๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



ที่ อก ๐๓๑๐(๑)/ ๑๒๓๖ ๘ /

กรมโรงงานอุตสาหกรรม

ถนนพระรามที่ ๖ แขวงทุ่งพญาไท

เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๑๘ ธันวาคม ๒๕๖๗

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบลอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒ ธันวาคม ๒๕๖๗

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบลอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ
เขตสวนหลวง กรุงเทพมหานคร ขอยกเลิกบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์
จำนวน ๘ ราย ได้แก่

- | | |
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| ๑) นายประพจน์ วรรณชูชัย | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๐ |
| ๒) นายจิรณัฐ ขาวละออ | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๒ |
| ๓) นายพิรพัฒน์ กำคำ | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๐๘ |
| ๔) นางสาวอรยา คำคล่อง | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๔ |
| ๕) นายกิตติพงศ์ แซ่ลี | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๔ |
| ๖) นายจิรเมธ ประเสริฐศิริพงศ์ | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๐ |
| ๗) นายภัทรพงษ์ มณฑาทอง | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๗ |
| ๘) นางสาวจรรวรมณ กระจ่างพันธุ์ | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๑ |

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

ร

(นายธีรทัศน์ อิศรางกูร ณ อยุธยา)

รองอธิบดี ปฏิบัติราชการแทน

อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๕๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



ที่ อก ๐๓๒๐/ ๗ ๙๓ ๘



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๐๘ สิงหาคม ๒๕๖๗

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์
เอกชน ลงวันที่ ๒๗ พฤษภาคม ๒๕๖๗

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๓ แผ่น

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุ
หนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๓๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕
ตำบลแม่ไม้คู อำเภอบลวกแดง จังหวัดระยอง ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย)
จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมห้องปฏิบัติการวิเคราะห์เอกชน

- | | |
|--------------------------|----------------------------|
| ๑) นายเดช ช่างชน | ทะเบียนเลขที่ ว-๓๒๓-ค-๐๐๐๑ |
| ๒) นางวิลาวัลย์ บริรักษ์ | ทะเบียนเลขที่ ว-๓๒๓-ค-๐๐๐๒ |
| ๓) นายสุพจน์ สสามเต๊ะ | ทะเบียนเลขที่ ว-๓๒๓-ค-๐๐๐๓ |

ข. เจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน

- | | |
|--------------------------------|----------------------------|
| ๑) นายณัฐพงษ์ เพ็งขาวนา | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๑ |
| ๒) นางสาวกัลยพรรณรัตน์ รักดี | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๒ |
| ๓) นางสาวจุฑารัตน์ สีทองกลาง | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๓ |
| ๔) นางสาวจิตสุภา ประเทืองสุข | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๔ |
| ๕) นายสรเสรีญ์ ค่อยกสุย | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๕ |
| ๖) นายณัฐวุฒิ ออมพรมราช | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๖ |
| ๗) นายจิตรกร สีวะสา | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๗ |
| ๘) นายสิทธิพงษ์ สุวรรณรัตน์ | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๘ |
| ๙) นายสิทธิพงษ์ เสนาชีว | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๐๙ |
| ๑๐) นายอนุวัฒน์ เตมา | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๐ |
| ๑๑) นายสุรวิทย์ นราพงษ์ | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๑ |
| ๑๒) นายณัฐพล เจียงวรวงศ์ | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๓ |
| ๑๓) นายชานนท์ บุญขึ้น | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๔ |
| ๑๔) นายณัฐกานต์ วงศ์อินทร์อยู่ | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๕ |
| ๑๕) นายอานนท์ โพธิ์พระทอง | ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๖ |

๑๖) นายณัฐพล...

-๒-

- ๑๖) นายณัฐพล ถ้ำกลาง
๑๗) นายศุภณัฐ พิสัยพันธ์
๑๘) นายวสันต์ คินันต์
๑๙) นายวรัญญู นิมาลี
๒๐) นายศุภณัฐ สกฤตติมศักดิ์
๒๑) นายเอกชัย ถันทอง
๒๒) นายพงษ์เทพ สิทธิเสาะ
๒๓) นายทินกร กุมภาชี
๒๔) นางสาวนันทยา เบญจจันทร์
๒๕) นายสิทธิชัย ยันพิมาย
๒๖) นางสาวภาณิน หลอดทอง
๒๗) นางสาวพจนิตา สีตา
๒๘) นางสาวณิศา กุลศิริวงศ์
๒๙) นายพิทยา ทองแดง
๓๐) นางสาวชลธิชา สุภกษ
๓๑) ว่าที่ร้อยตรี ธนชัย ม่วงมา
๓๒) นายวรารุณ พิบพา
๓๓) นายศักดิ์รินทร์ จรัสกาย
๓๔) นายสุรศักดิ์ สาขิน
๓๕) นายสถาพร ถาแก้ว
๓๖) นายสุทธิดำรง โชคปิตินันท์
๓๗) นายวิมลภัก หันไชยเนาว์
๓๘) นางสาววนาลี เจริญตระกูล
๓๙) นายธนสิทธิ์ วงศ์ไชย
๔๐) นายชัยนุสรณ์ เลิศนันทกุลชัย
๔๑) นายสิจจา เพ็ชรแสวง
๔๒) นายกัณตภณ มณีสัมพันธ์
๔๓) นายธารินทร์ อ็อกจินดา
๔๔) นายศุภชัย วงศ์สุริยฉาย
๔๕) นายไสว ตันโพธิ์
๔๖) นางสาวกิตติยา สันญาอริยาภรณ์
๔๗) นางสาวธิดารัตน์ ศิริมงคลโร
๔๘) นายพิพัฒน์ นิภัทร์เศรษฐ์
๔๙) นายศิริวิทย์ เรืองสม
๕๐) นายปารเมศ สัตยาคุณ
๕๑) นายณฤนาท ธรรมสโร
๕๒) นางสาวศุภรัตน์ โสจันทร์

- ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๗
ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๘
ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๑๙
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ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๔๗
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ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๒
ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๓

๕๒) นายพชรกร...

๕๒) นายพชรกร เจ็งเจริญ	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๔
๕๓) นายทิวากร เชื้อมาก	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๕
๕๔) นายอนุรักษ์ ทองขจรศักดิ์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๖
๕๕) นายอภิชาติ วิลาศ	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๗
๕๖) นายจรัสระวี ศรีรักษา	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๘
๕๘) นายประสานมิตร เชื้อนเพชร	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๙
๕๙) นายภาณุวัฒน์ วังบง	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๖๐
๖๐) นายสันติ ชัยชนะ	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๖๑
๖๑) นายทินกร กุลชาติ	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๖๒

ค. ขอบข่ายชนิดสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒๘ มิถุนายน ๒๕๗๑ หากประสงค์จะต่ออายุหนังสือ รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๖๐ วัน ก่อนวันสิ้นสุดอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ


(นายพรยศ กลั่นกรอง)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
โทร. ๐ ๓๓๑๓ ๖๐๕๔ ต่อ ๕๐๐๑-๒
ไปรษณีย์อิเล็กทรอนิกส์ ejrw@djw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบบอราทอรี กรุป (ประเทศไทย) จำกัด เลขทะเบียน ว-๓๒๓
ที่ อก ๐๓๒๐/ ๗ ๙๙ ๘ ลงวันที่ ๐๔ สิงหาคม ๒๕๖๓

ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม 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 ^[5] 2) Instrumental Analyzer Method ^[9]
2	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[5]
3	Opacity	Ringelmann's Method ^[3,4]
4	Oxide of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ^[8] 2) Instrumental Analyzer Method ^[10]
5	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Acid Method ^[5] 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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ที่ อก ๐๓๒๐/ ๑ ๐ ๐ ๙ ๙



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