Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264815
Date Received : Jun 19, 2022
Date Reported : Jun 22, 2022
Report Number : 2325692-2

Sample Number	2264815-1
Sampled Date	Jun 19, 2022 9:20 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 20, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	5.8	No Standard	Based on APHA (2017), 4500-O(C)	Rayong

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

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

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Approved by

Narumon Banchongkit
Supervisor

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264816
Date Received : Jun 20, 2022
Date Reported : Jun 23, 2022
Report Number : 2325691-1

Sample Number	2264816-1
Sampled Date	Jun 20, 2022 9:50 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 20, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C		-	-	7.7	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	34.3	≤40	Based on APHA (2017), 2550 B	Rayong

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

Remark :
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Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ค-9442

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

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264816
Date Received : Jun 20, 2022
Date Reported : Jun 23, 2022
Report Number : 2325691-2

Sample Number	2264816-1
Sampled Date	Jun 20, 2022 9:50 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 23, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	6.8	No Standard	Based on APHA (2017), 4500-O(C)	Rayong

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

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Narumon Banchongkit
Supervisor

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264817
Date Received : Jun 21, 2022
Date Reported : Jun 24, 2022
Report Number : 2325689-1

Sample Number	2264817-1
Sampled Date	Jun 21, 2022 9:15 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 21, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C		-	-	7.6	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	34.1	≤40	Based on APHA (2017), 2550 B	Rayong

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

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Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ค-9442

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264817
Date Received : Jun 21, 2022
Date Reported : Jun 24, 2022
Report Number : 2325689-2

Sample Number	2264817-1
Sampled Date	Jun 21, 2022 9:15 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 23, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	6.6	No Standard	Based on APHA (2017), 4500-O(C)	Rayong

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

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Narumon Banchongkit
Supervisor

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264818
Date Received : Jun 22, 2022
Date Reported : Jun 24, 2022
Report Number : 2325688-1

Sample Number	2264818-1
Sampled Date	Jun 22, 2022 9:00 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 22, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C		-	-	7.7	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	33.8	≤40	Based on APHA (2017), 2550 B	Rayong

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

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Technical Management

Narumon Banchongkit
Supervisor
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Approved by

Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ค-9442

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264818
Date Received : Jun 22, 2022
Date Reported : Jun 24, 2022
Report Number : 2325688-2

Sample Number	2264818-1
Sampled Date	Jun 22, 2022 9:00 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 23, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	5.8	No Standard	Based on APHA (2017), 4500-O(C)	Rayong

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

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Narumon Banchongkit
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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264819
Date Received : Jun 23, 2022
Date Reported : Jun 27, 2022
Report Number : 2325686-1

Sample Number	2264819-1
Sampled Date	Jun 23, 2022 9:30 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 23, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C		-	-	7.6	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	33.2	≤40	Based on APHA (2017), 2550 B	Rayong

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

Remark :
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Technical Management

Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by

Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ค-9442

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264819
Date Received : Jun 23, 2022
Date Reported : Jun 27, 2022
Report Number : 2325686-2

Sample Number	2264819-1
Sampled Date	Jun 23, 2022 9:30 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 24, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	7.6	No Standard	Based on APHA (2017), 4500-O(C)	Rayong

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

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Narumon Banchongkit
Supervisor

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264820
Date Received : Jun 24, 2022
Date Reported : Jun 29, 2022
Report Number : 2325685-1

Sample Number	2264820-1
Sampled Date	Jun 24, 2022 9:50 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 24, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C		-	-	7.8	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	31.7	≤40	Based on APHA (2017), 2550 B	Rayong

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

Remark :
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Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ค-9442

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264820
Date Received : Jun 24, 2022
Date Reported : Jun 29, 2022
Report Number : 2325685-2

Sample Number	2264820-1
Sampled Date	Jun 24, 2022 9:50 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 28, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	6.4	No Standard	Based on APHA (2017), 4500-O(C)	Rayong

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

Remark :
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Approved by

Narumon Banchongkit
Supervisor

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264821
Date Received : Jun 25, 2022
Date Reported : Jun 29, 2022
Report Number : 2325684-1

Sample Number	2264821-1
Sampled Date	Jun 25, 2022 8:55 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 25, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C		-	-	7.6	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	34.2	≤40	Based on APHA (2017), 2550 B	Rayong

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

Remark :
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Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ค-9442

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264821
Date Received : Jun 25, 2022
Date Reported : Jun 29, 2022
Report Number : 2325684-2

Sample Number	2264821-1
Sampled Date	Jun 25, 2022 8:55 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 28, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	6.7	No Standard	Based on APHA (2017), 4500-O(C)	Rayong

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

Remark :
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Narumon Banchongkit
Supervisor

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264822
Date Received : Jun 26, 2022
Date Reported : Jun 29, 2022
Report Number : 2325681-1

Sample Number	2264822-1
Sampled Date	Jun 26, 2022 8:40 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 26, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C		-	-	7.7	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	33.0	≤40	Based on APHA (2017), 2550 B	Rayong

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

Remark :
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Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ค-9442

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

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264822
Date Received : Jun 26, 2022
Date Reported : Jun 29, 2022
Report Number : 2325681-2

Sample Number	2264822-1
Sampled Date	Jun 26, 2022 8:40 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 28, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	6.3	No Standard	Based on APHA (2017), 4500-O(C)	Rayong

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

Remark :
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Narumon Banchongkit
Supervisor

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264823
Date Received : Jun 27, 2022
Date Reported : Jun 29, 2022
Report Number : 2325678-1

Sample Number	2264823-1
Sampled Date	Jun 27, 2022 9:55 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 27, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C		-	-	7.8	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	33.9	≤40	Based on APHA (2017), 2550 B	Rayong

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

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Technical Management
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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264823
Date Received : Jun 27, 2022
Date Reported : Jun 29, 2022
Report Number : 2325678-2

Sample Number	2264823-1
Sampled Date	Jun 27, 2022 9:55 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 28, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	7.0	No Standard	Based on APHA (2017), 4500-O(C)	Rayong

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

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TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264824
Date Received : Jun 28, 2022
Date Reported : Jul 01, 2022
Report Number : 2325677-1

Sample Number	2264824-1
Sampled Date	Jun 28, 2022 10:00 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 28, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C		-	-	7.7	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	35.0	≤40	Based on APHA (2017), 2550 B	Rayong

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

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Technical Management

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Dej Changchon
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Analysis / Test Report

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92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264824
Date Received : Jun 28, 2022
Date Reported : Jul 01, 2022
Report Number : 2325677-2

Sample Number	2264824-1
Sampled Date	Jun 28, 2022 10:00 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 30, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	7.0	No Standard	Based on APHA (2017), 4500-O(C)	Rayong

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

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TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264825
Date Received : Jun 29, 2022
Date Reported : Jul 01, 2022
Report Number : 2325673-1

Sample Number	2264825-1
Sampled Date	Jun 29, 2022 9:00 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 29, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C		-	-	7.9	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	34.4	≤40	Based on APHA (2017), 2550 B	Rayong

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

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Technical Management

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Approved by

Dej Changchon
Senior Manager
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Analysis / Test Report

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92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264825
Date Received : Jun 29, 2022
Date Reported : Jul 01, 2022
Report Number : 2325673-2

Sample Number	2264825-1
Sampled Date	Jun 29, 2022 9:00 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 30, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	6.9	No Standard	Based on APHA (2017), 4500-O(C)	Rayong

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

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264826
Date Received : Jun 30, 2022
Date Reported : Jul 04, 2022
Report Number : 2325672-1

Sample Number	2264826-1
Sampled Date	Jun 30, 2022 9:30 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jun 30, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C		-	-	7.5	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	34.3	≤40	Based on APHA (2017), 2550 B	Rayong

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

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Technical Management
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Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ค-9442

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264826
Date Received : Jun 30, 2022
Date Reported : Jul 04, 2022
Report Number : 2325672-2

Sample Number	2264826-1
Sampled Date	Jun 30, 2022 9:30 AM
Sample Description	Wastewater
Location	บ่อตรวจวัดคุณภาพน้ำทิ้งของโครงการ (Holding pond)
Date Analysis Commenced	Jul 01, 2022
Condition of Sample	Contained in one plastic bottle and one BOD bottle. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Dissolved Oxygen	mg/L	-	0.1	7.4	No Standard	Based on APHA (2017), 4500-O(C)	Rayong

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

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 21152557
Date Received : Jan 11, 2022
Date Reported : Jan 18, 2022
Report Number : 2206608-1

Sample Number	21152557-1
Sampled Date	Jan 11, 2022 9:20 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่ก่อนไหลผ่านพื้นที่ 500 เมตร
Date Analysis Commenced	Jan 11, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	3.0	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	6.6	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.6	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	76	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Pathompong Kornsawat

Remark :
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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 21152557
Date Received : Jan 11, 2022
Date Reported : Jan 18, 2022
Report Number : 2206608-1

Sample Number	21152557-2
Sampled Date	Jan 11, 2022 9:40 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่จุดระบายน้ำทิ้ง
Date Analysis Commenced	Jan 11, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	6.4	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.5	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.8	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	230	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Pathompong Kornsawat

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 21152557
Date Received : Jan 11, 2022
Date Reported : Jan 18, 2022
Report Number : 2206608-1

Sample Number	21152557-3
Sampled Date	Jan 11, 2022 9:00 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่จุดระบายน้ำทิ้ง 500 เมตร
Date Analysis Commenced	Jan 11, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	4.6	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.1	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.7	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	218	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Pathompong Kornsawat

Remark :
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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 21152557
Date Received : Jan 11, 2022
Date Reported : Jan 18, 2022
Report Number : 2206608-1

Sample Number	21152557-4
Sampled Date	Jan 11, 2022 10:10 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่หลังจุดระบายน้ำทิ้ง 2,000 เมตร
Date Analysis Commenced	Jan 11, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	7.6	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.9	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.8	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1560	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Pathompong Kornsawat

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

Narumon Banchongkit
Supervisor

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 224483
Date Received : Feb 08, 2022
Date Reported : Feb 15, 2022
Report Number : 2201751-1

Sample Number	224483-1
Sampled Date	Feb 08, 2022 9:15 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่ก่อนไหลผ่านพื้นที่ 500 เมตร
Date Analysis Commenced	Feb 08, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	5.0	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.1	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	28.1	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	85	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Chainusorn Lertnanthakunchai

Remark :
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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 224483
Date Received : Feb 08, 2022
Date Reported : Feb 15, 2022
Report Number : 2201751-1

Sample Number	224483-2
Sampled Date	Feb 08, 2022 9:25 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่จุดระบายน้ำทิ้ง
Date Analysis Commenced	Feb 08, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	6.2	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.2	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	28.4	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	132	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Chainusorn Lertnanthakunchai

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 224483
Date Received : Feb 08, 2022
Date Reported : Feb 15, 2022
Report Number : 2201751-1

Sample Number	224483-3
Sampled Date	Feb 08, 2022 9:05 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่จุดระบายน้ำทิ้ง 500 เมตร
Date Analysis Commenced	Feb 08, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	4.9	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.2	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	28.4	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	210	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Chainusorn Lertnanthakunchai

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 224483
Date Received : Feb 08, 2022
Date Reported : Feb 15, 2022
Report Number : 2201751-1

Sample Number	224483-4
Sampled Date	Feb 08, 2022 10:05 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่หลังจุดระบายน้ำทิ้ง 2,000 เมตร
Date Analysis Commenced	Feb 08, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	7.6	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.8	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	30.3	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	948	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Chainusorn Lertnanthakunchai

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2216402
Date Received : Mar 29, 2022
Date Reported : Apr 04, 2022
Report Number : 2224593-1

Sample Number	2216402-1
Sampled Date	Mar 29, 2022 9:00 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่ก่อนไหลผ่านพื้นที่ 500 เมตร
Date Analysis Commenced	Mar 29, 2022
Condition of Sample	Contained in two plastic bottles and one BOD bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	5.8	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	6.9	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	30.5	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	74	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Chainusorn Lertnanthakunchai

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2216402
Date Received : Mar 29, 2022
Date Reported : Apr 04, 2022
Report Number : 2224593-1

Sample Number	2216402-2
Sampled Date	Mar 29, 2022 9:05 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่จุดระบายน้ำทิ้ง
Date Analysis Commenced	Mar 29, 2022
Condition of Sample	Contained in two plastic bottles and one BOD bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	7.4	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.2	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	30.4	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	162	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Chainusorn Lertnanthakunchai

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2216402
Date Received : Mar 29, 2022
Date Reported : Apr 04, 2022
Report Number : 2224593-1

Sample Number	2216402-3
Sampled Date	Mar 29, 2022 8:50 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่จุดระบายน้ำทิ้ง 500 เมตร
Date Analysis Commenced	Mar 29, 2022
Condition of Sample	Contained in two plastic bottles and one BOD bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	5.5	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.4	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	30.4	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	170	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Chainusorn Lertnanthakunchai

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2216402
Date Received : Mar 29, 2022
Date Reported : Apr 04, 2022
Report Number : 2224593-1

Sample Number	2216402-4
Sampled Date	Mar 29, 2022 9:30 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่หลังจุดระบายน้ำทิ้ง 2,000 เมตร
Date Analysis Commenced	Mar 29, 2022
Condition of Sample	Contained in two plastic bottles and one BOD bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	6.5	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.4	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	32.6	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1440	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Chainusorn Lertnanthakunchai

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2227588
Date Received : Apr 28, 2022
Date Reported : May 04, 2022
Report Number : 2246799-1

Sample Number	2227588-1
Sampled Date	Apr 28, 2022 9:24 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่ก่อนไหลผ่านพื้นที่ 500 เมตร
Date Analysis Commenced	Apr 28, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	5.2	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	6.8	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	31.2	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	78	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Pathompong Kornsawat

Remark :
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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2227588
Date Received : Apr 28, 2022
Date Reported : May 04, 2022
Report Number : 2246799-1

Sample Number	2227588-2
Sampled Date	Apr 28, 2022 9:20 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่จุดระบายน้ำทิ้ง
Date Analysis Commenced	Apr 28, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	5.7	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	6.8	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	31.5	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	84	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Pathompong Kornsawat

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2227588
Date Received : Apr 28, 2022
Date Reported : May 04, 2022
Report Number : 2246799-1

Sample Number	2227588-3
Sampled Date	Apr 28, 2022 9:10 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่จุดระบายน้ำทิ้ง 500 เมตร
Date Analysis Commenced	Apr 28, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	8.3	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.0	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	31.6	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	206	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Pathompong Kornsawat

Remark :
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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2227588
Date Received : Apr 28, 2022
Date Reported : May 04, 2022
Report Number : 2246799-1

Sample Number	2227588-4
Sampled Date	Apr 28, 2022 9:49 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่หลังจุดระบายน้ำทิ้ง 2,000 เมตร
Date Analysis Commenced	Apr 28, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	7.1	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.6	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	32.5	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1000	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Pathompong Kornsawat

Remark :
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Approved by

Narumon Banchongkit
Supervisor

Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2242553
Date Received : May 26, 2022
Date Reported : Jun 02, 2022
Report Number : 2279681-1

Sample Number	2242553-1
Sampled Date	May 26, 2022 9:00 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่ก่อนไหลผ่านพื้นที่ 500 เมตร
Date Analysis Commenced	May 26, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	6.3	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	6.7	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.7	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	76	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Tanasit Wongsachai

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2242553
Date Received : May 26, 2022
Date Reported : Jun 02, 2022
Report Number : 2279681-1

Sample Number	2242553-2
Sampled Date	May 26, 2022 8:55 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่จุดระบายน้ำทิ้ง
Date Analysis Commenced	May 26, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	5.3	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.0	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.7	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	78	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Tanasit Wongsachai

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2242553
Date Received : May 26, 2022
Date Reported : Jun 02, 2022
Report Number : 2279681-1

Sample Number	2242553-3
Sampled Date	May 26, 2022 8:45 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่จุดระบายน้ำทิ้ง 500 เมตร
Date Analysis Commenced	May 26, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	4.9	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.2	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	29.8	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	164	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Tanasit Wongsachai

Remark :
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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2242553
Date Received : May 26, 2022
Date Reported : Jun 02, 2022
Report Number : 2279681-1

Sample Number	2242553-4
Sampled Date	May 26, 2022 9:23 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่หลังจุดระบายน้ำทิ้ง 2,000 เมตร
Date Analysis Commenced	May 26, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	8.2	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.7	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	31.0	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1012	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Tanasit Wongsachai

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264797
Date Received : Jun 20, 2022
Date Reported : Jun 27, 2022
Report Number : 2325662-1

Sample Number	2264797-1
Sampled Date	Jun 20, 2022 9:28 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่ก่อนไหลผ่านพื้นที่ 500 เมตร
Date Analysis Commenced	Jun 20, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	3	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	5.4	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.1	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	31.1	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	85	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Chainusorn Lertnanthakunchai

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264797
Date Received : Jun 20, 2022
Date Reported : Jun 27, 2022
Report Number : 2325662-1

Sample Number	2264797-2
Sampled Date	Jun 20, 2022 9:34 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่จุดระบายน้ำทิ้ง
Date Analysis Commenced	Jun 20, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	6.0	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.5	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	30.4	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	111	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Chainusorn Lertnanthakunchai

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264797
Date Received : Jun 20, 2022
Date Reported : Jun 27, 2022
Report Number : 2325662-1

Sample Number	2264797-3
Sampled Date	Jun 20, 2022 9:20 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่จุดระบายน้ำทิ้ง 500 เมตร
Date Analysis Commenced	Jun 20, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	4.9	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	7.3	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	30.5	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	250	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Chainusorn Lertnanthakunchai

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Analysis / Test Report

TESTING
No.0042

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location: CUP 2

Lot ID: 2264797
Date Received : Jun 20, 2022
Date Reported : Jun 27, 2022
Report Number : 2325662-1

Sample Number	2264797-4
Sampled Date	Jun 20, 2022 10:12 AM
Sample Description	Surface water
Location	คลองห้วยใหญ่หลังจุดระบายน้ำทิ้ง 2,000 เมตร
Date Analysis Commenced	Jun 20, 2022
Condition of Sample	Contained in one BOD bottle and two plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C) *	mg/L	-	2	<2	≤4	APHA (2017), 5210 B	Rayong
Dissolved Oxygen *	mg/L	-	0.1	7.0	≥2	Based on APHA (2017), 4500-O(C)	Rayong
pH at 25 degree C		-	-	8.0	5.0-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	31.9	n'	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1390	No Standard	APHA (2017), 2540 C	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazettle, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)
n': Change from Natural condition not more than 3 degree C
Sampled By : Chainusorn Lertnanthakunchai

Remark :
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92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 2226699
Date Received : Mar 08, 2022
Date Reported : Mar 11, 2022
Report Number: 2245044-1

Sample Number 2226699-1
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Mar 07, 2022
Measurement by Natthapon Jiengwareewong
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
Auxiliary Boiler	120	29.0	26.9	34.1	33.1
Average (WBGT)		29.0			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Technical Management
Supot Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

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92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 2226699
Date Received : Mar 08, 2022
Date Reported : Mar 11, 2022
Report Number: 2245044-1

Sample Number	2226699-2
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date	Mar 07, 2022
Measurement by	Natthapon Jiengwareewong
Location	ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
HRSG #1	120	28.8	26.5	34.1	33.8
Average (WBGT)		28.8			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Technical Management
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 2226699
Date Received : Mar 08, 2022
Date Reported : Mar 11, 2022
Report Number: 2245044-1

Sample Number 2226699-3
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Mar 07, 2022
Measurement by Natthapon Jiengwareewong
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
HRSG #2	120	28.3	26.3	33.2	32.7
Average (WBGT)		28.3			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Technical Management
Supot Salamteh
Section Head

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Assistant Manager

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 2226699
Date Received : Mar 08, 2022
Date Reported : Mar 11, 2022
Report Number: 2245044-1

Sample Number 2226699-4
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Mar 07, 2022
Measurement by Natthapon Jiengwareewong
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
GTG #1	120	28.5	26.4	33.7	33.0
Average (WBGT)		28.5			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Technical Management
Supot Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any from with out written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 2226699
Date Received : Mar 08, 2022
Date Reported : Mar 11, 2022
Report Number: 2245044-1

Sample Number	2226699-5
Parameter	Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date	Mar 07, 2022
Measurement by	Natthapon Jiengwareewong
Location	ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
GTG #2	120	28.7	26.4	34.1	33.6
Average (WBGT)		28.7			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Technical Management
Supot Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Global Power Synergy Public Company Limited
92/9, Rayong Highway Road 3191, Map Ta Phut, Mueang, Rayong Thailand 21150
P/O :
Project Name : Monitoring
Project Location : CUP 2

Lot ID: 2226699
Date Received : Mar 08, 2022
Date Reported : Mar 11, 2022
Report Number: 2245044-1

Sample Number 2226699-6
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Mar 07, 2022
Measurement by Natthapon Jiengwareewong
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
STG #1	120	29.2	26.8	34.7	34.4
Average (WBGT)		29.2			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Technical Management
Supot Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

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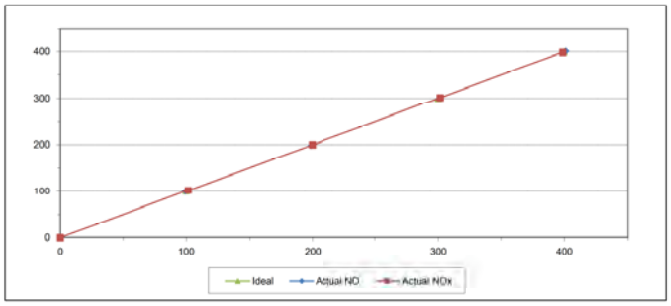
ภาคผนวก ง

ใบรับรองการสอบเทียบเครื่องมือ

MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jan-22	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	NV0ER3YH	Equipment ID	RYG_FS0459
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	51.33	Cylinder No.	LL36633
Cylinder Pressure (psi)	1200	Certified By	Airgas Inc.
Certified Date	18-Mar-14	Expired Date	18-Mar-22

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.05	0.05	0.05	0.10	0.10	0.10
1	100.00	99.50	-0.50	-0.50	101.80	1.80	1.80
2	200.00	198.70	-1.30	-0.65	199.70	-0.30	-0.15
3	300.00	301.10	1.10	0.37	301.50	1.50	0.50
4	400.00	401.30	1.30	0.33	398.90	-1.10	-0.28
AVERAGE (%)				-0.08			0.39



Calibrated By

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

Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

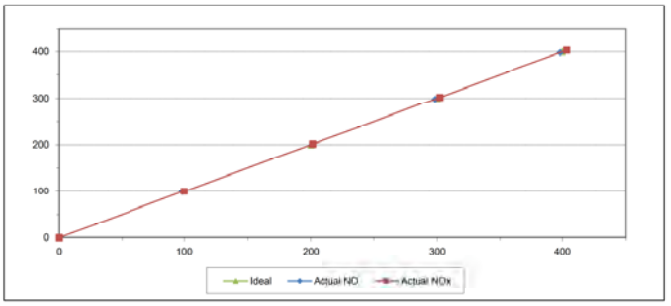
ALS Laboratory Group

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

MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jan-22	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	T95HWM41	Equipment ID	RYG_FS0461
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	51.33	Cylinder No.	LL36633
Cylinder Pressure (psi)	1200	Certified By	Airgas Inc.
Certified Date	18-Mar-14	Expired Date	18-Mar-22

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Eror 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	100.10	0.10	0.10
2	200.00	201.00	1.00	0.50	201.40	1.40	0.70
3	300.00	298.30	-1.70	-0.57	302.10	2.10	0.70
4	400.00	398.40	-1.60	-0.40	403.50	3.50	0.88
AVERAGE (%)				-0.33			0.50



Calibrated By

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

Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

ALS Laboratory Group

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

63/14-15,67/35-36, Soi Petchkasem7,7/1, Petchkasem Rd,
Watthapra, Bangkokyai,Bangkok 10600 Thailand.
Tel.: (66) 02-8680812#13 Fax.: (66) 02-8680860 www.jiranatee.com

CERTIFICATE OF CALIBRATION

Certificate No: WS-12072021
Page 1 of 2 pages

Measurement Item	: Cup anemometer with data logger.	
Manufacturer	: Data logger: Novalynx. : Cup anemometer: Novalynx.	
Model/Type	: Data logger: 200-WS-20LB. : Cup anemometer: WS-02F.	
Serial Number	: Data logger: A5374. : Cup anemometer: -.	
ID No	: Data logger: FIYO_F00412. : Cup anemometer: -.	
Customer	: ALS laboratory group (Thailand co., ltd. : 104 Phatthanakan 40, Phatthanakan Rd, Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250 Thailand.	
Test Conditions	: Wind tunnel cross test section area	900 cm^2
	: Anemometer frontal area	100 cm^2
	: Diameter of mounting pipe	- mm
	: Blockage ratio of test object	0.111 [-]
Test Conditions	: Air temperature	23.9 ±0.8 °C
	: Air pressure	1007.7 ±0.4 hPa
	: Relative air humidity	57.7 ±3.5 %RH

REVIEW BY
APPROVED BY
NEXT CAL. DATE 27/1/23

Calibration Procedure: Calibration was carried out base on;
IEC 61400-12-1 ED.1: 2005-Power Performance Measurements of Electricity Producing Wind Turbines;
MEASNET Anemometer Calibration Procedure – Version 2: 2009;

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

Measurement Date : Jul 29, 2021.
Issued Date : Jul 29, 2021.

Calibrated by
☑ Mr. Borawit Thachaisit
☐ Miss Orathai Wiwatwitaya

Approved Signatory:
Mr. Parinya Booncharoen
Technical Support
and Calibration Manager

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

63/14-15,67/35-36, Soi Petchkasem7,7/1, Petchkasem Rd,
Watthapra, Bangkokyai,Bangkok 10600 Thailand.
Tel.: (66) 02-8680812#13 Fax.: (66) 02-8680860 www.jiranatee.com

Continuation of Certificate of Calibration Number

Certificate No: WS-12072021
Page 2 of 2 Pages

Result of calibration: ☑ Without adjustment ☐ With adjustment
Calibration in the range of 1 – 16 m/s at a calibration interval of 1 m/s.
The results of calibration and associated measurement uncertainties are reported in the table below.

V_{STD} Reading m/s	V_{UUC} Reading m/s	Error (m/s)	Uncertainty (%)
2.075	2.0	-0.1	2.5
4.150	4.1	-0.1	1.3
5.98	6.0	0.0	0.98
8.01	8.1	0.1	0.66
10.03	10.1	0.1	0.77
12.02	12.2	0.2	0.65
13.98	14.3	0.3	0.41
16.03	16.4	0.4	0.59
14.98	15.3	0.3	0.49
13.00	13.2	0.2	0.61
11.01	11.1	0.1	0.52
8.97	9.0	0.0	0.97
7.01	7.0	0.0	0.81
5.196	5.1	-0.1	0.98
2.980	3.1	0.1	1.7
1.037	0.9	-0.1	5.4

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

Appendix 1: Instrumentations

NO	Sensor	Manufacturer	Model/Type	Calibration Date	Certificate Report Number	Range
1	Pito static	TESTO INC.	05352145	July 16, 2020	MW-0035-20	5 – 30 m/s
2	Precision Differential Pressure Meter	Zoglab	DPM2500	July 16, 2020	MW-0035-20	5 – 30 m/s
3	Air velocity transducer (hot wire)	TSI INC.	8455-12	July 20, 2020	MW-0036AA-20	0 – 5 m/s
4	Temperature	Zoglab	DSR-THP	March 30, 2021	CL-027-64	-30 – 70°C
5	Relative humidity	Zoglab	DSR-THP	March 30, 2021	RH-03032021	0 – 100 %RH
6	Atmospheric pressure	Zoglab	DSR-THP	March 30, 2021	BP-01032021	500 – 1100 hPa
7	Wind tunnel	DSSOM	MP330D	-	-	0 – 50 Hz

End of certificate of calibration

63/14-15,67/35-36, Soi Petchkasem7,7/1, Petchkasem Rd,
Watthapra, Bangkokyai,Bangkok 10600 Thailand.
Tel.: (66) 02-8680812#13 Fax.: (66) 02-8680860 www.jiranatee.com

CERTIFICATE OF CALIBRATION

Certificate No.: WD-12072021

Measurement Item : Wind direction sensor with data logger.

Manufacturer : Data logger: Novalynx.
: Wind direction sensor: Novalynx.

Model/Type : Data logger: 200-WS-25LB.
: Wind direction sensor: WS-02F.

Serial Number : Data logger: A5374.
: Wind direction sensor: -.

ID No : Data logger: RYO_FS0412.
: Wind direction sensor: -.

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

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

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

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

Traceability:
The measurement results are traceable to the international system of units (SI) through Certificate No.: CC663-07-0045, Certificate No.: KWS63/0044.

Measurement Date : Jul 29, 2021.
Issued Date : Jul 29, 2021.

Performed by
☑ Mr. Sorawit Thaihalat
☐ Miss Orathai Wiwatwitaya

JIRANATE ASSOCIATES CO., LTD.

Approved Signatory:

Mr. Parinya Booncharoen.
Technical Support
and Calibration Manager

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63/14-15,67/35-36, Soi Petchkasem7,7/1, Petchkasem Rd,
Watthapra, Bangkokyai,Bangkok 10600 Thailand.
Tel.: (66) 02-8680812#13 Fax.: (66) 02-8680860 www.jiranatee.com

Continuation of Certificate of Calibration Number

Certificate No: WD-12072021

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

NO	Turning Direction	Nominal Angle (°)	Standard Reading (°)	UUC* Reading (°)	Error (°)	Uncertainty ±(°)
1	Clockwise	0/360	360	359	-1	3.0
2		45	45	42	-3	3.0
3		90	90	87	-3	3.0
4		135	135	133	-2	3.0
5		180	180	178	-2	3.0
6		225	225	226	1	3.0
7		270	270	273	3	3.0
8		315	315	318	3	3.0
9	Counter Clockwise	0/360	360	359	-1	3.0
10		45	45	42	-3	3.0
11		90	90	87	-3	3.0
12		135	135	133	-2	3.0
13		180	180	178	-2	3.0
14		225	225	226	1	3.0
15		270	270	273	3	3.0
16		315	315	318	3	3.0

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

End of Certificate of Calibration

JIRANATE ASSOCIATES CO., LTD.

CONSOLE CONTROL UNIT CALIBRATION TEST REPORT

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

Barometric Pressure (mm.Hg) : 760
Relative Humidity (%) : 55.6
Temperature (°C) : 28.6

Console Control Meter Data
Calibration No. : C-120122-BKK_FS0463
Dry Gas Meter No. : BKK_FS0468
Console Serial No. : 1302005
Console Model No. : XC-572-V

Reference Dry Gas Meter Data
Serial No. : 1601009
Model No. : SK25EXSR-QC6
Correction Factor (Yr) : 1.0060
Next Calibration Date : 8 Apr 22

ΔH (mm.H2O)	θ Minutes	Reference Dry Gas Meter Calibration Vr (Liters) Final	Vr (Liters) Initial	Vr (Liters) Total	Tr (°C)	Console Control ; Drygas Meter Vm (Liters) Final	Vm (Liters) initial	Vm (Liters) Total	Ti (°C)	To (°C)	Avg.Tm (°C)	Dry Gas Meter Correction Factor (Y)	Orifice Calibration Factor ΔH@
15	12.38	150.00	0.00	150.00	30.0	2554504.8	2564355.0	149.00	29.0	29.0	29.0	1.0009	47.9425
25	9.33	150.00	0.00	150.00	31.0	2554661.6	2564510.0	151.00	30.0	30.0	30.0	0.9956	44.6773
50	6.57	150.00	0.00	150.00	31.0	2554821.6	2564670.0	151.00	31.0	31.0	31.0	0.9945	44.1625
80	5.14	150.00	0.00	150.00	31.0	2554983.6	2564830.0	153.00	32.0	32.0	32.0	0.9879	43.1065
120	4.18	150.00	0.00	150.00	32.0	2555149.6	2564995.0	154.00	32.0	32.0	32.0	0.9866	43.0440
											Avg.	0.9931	44.4066

Y : Ratio of reading of reference to dry gas meter tolerance for individual values ± 0.02 from average.
ΔH@ : Orifice pressure differential that equates to 21.24 mm of air @ 25 C and 760 mm of mercury , mmH2O ; tolerance for individual values ± 0.66 from average.
Procedure: 40 CFR 60,APP A,METH .SEC 5.3 & 7

Calibrated by: Saksit Phaisanphisut
(Mr.Saksit Phaisanphisut)
Field Scientist (4)

Approved by: Wichan Choonharat
(Mr.Wichan Choonharat)
Manager

FM-TS-01-03 (12/01/18)

DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date :	12-Jan-22	Ambient Temperature (°C)	28
Calibration sheet No. :	C-120122-BKK_FS0469	Relative Humidity (%) :	55
Digital Temperature ID	BKK_FS0469	Reference Temperature ID	BKK_FS0609
Serial No. :	1302005	Serial No. :	7688004
Model :	XC-572-V	Model :	FLUKE 714
		Next Calibrate :	13 Jan 22

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

Calibrated by: Saksit Phaisanphisut
(Mr.Saksit Phaisanphisut)
Field Scientist (4)

Approved by: Wichan Choonharat
Mr.Wichan Choonharat
Manager

Form ZB1-048 (02/05/02)

Pitot Tube Calibration Data

Pitot Tube Identification Number : BKK_FS0472
Lab test duct Number : 258-1-13-01
Calibration Sheet No. : C-120122-BKK_FS0472
Calibration Date : 12 Jan 22
Standard Pitot ID : BKK_FS0441
Cp Standard : 0.99

Type S Pitot Tube Coefficient Data					
	Type s pitot tube Leg A,B	Standard pitot tube (ΔP, mm.H_2O)	Type s pitot tube (ΔP, mm.H_2O)	Cp (s) Leg A	Cp (s) Leg B
Test 1	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
Test 2	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
Test 3	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
			$\overline{Cp}$	0.842	0.842

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

$$\left[\overline{Cp}_{(A)} - \overline{Cp}_{(B)}\right] must\ BE \leq 0.01$$

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

Calibrated by : Saksit Phaisanphisut
(Mr.Saksit Phaisanphisut)
Field Scientist (4)

Approved by : Wichan Choonharat
Mr.Wichan Choonharat
Manager

Form 281-046 (04/03/02)

Pitot Tube Calibration Data

Pitot Tube Identification Number : BKK_FS0473
Lab test duct Number : 258-1-13-01
Calibration Sheet No. : C-120122-BKK_FS0473
Calibration Date : 12 Jan 22
Standard Pitot ID : BKK_FS0441
Cp Standard : 0.99

Type S Pitot Tube Coefficient Data					
	Type s pitot tute Leg A,B	Standard pitot tube (ΔP, mm.H_2O)	Type s pitot tube (ΔP, mm.H_2O)	Cp (s) Leg A	Cp (s) Leg B
Test 1	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
Test 2	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
Test 3	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
			$\overline{Cp}$	0.842	0.842

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

$$\left[\overline{Cp}_{(A)} - \overline{Cp}_{(B)}\right] must\ BE \leq 0.01$$

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

Calibrated by : Saksit Phaisanphisut
(Mr.Saksit Phaisanphisut)
Field Scientist (4)

Approved by : Wichan Choonharat
Mr.Wichan Choonharat
Manager

Form 281-046 (04/03/02)

PROBE NOZZLE DIAMETER
CALIBRATION DATA SHEET

Calibration Date 12 Jan 22
Calibration Sheet No. : C-120122-BKK_FS0474
Nozzle Set ID. : BKK_FS0474
Vernier Caliper ID. : BKK_FS0626

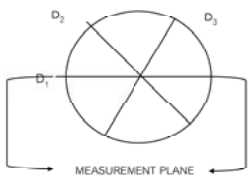
Nozzle ID #	Nozzle Diameter (cm.)			Hi - Lo	$(D_1 + D_2 + D_3) / 3$
	D_1	D_2	D_3	ΔD	D_{avg}
1	0.300	0.300	0.300	0.000	0.300
2	0.450	0.450	0.450	0.000	0.450
3	0.600	0.600	0.600	0.000	0.600
4	0.780	0.780	0.780	0.000	0.780
5	0.932	0.932	0.932	0.000	0.932
6	1.094	1.094	1.094	0.000	1.094
7	1.264	1.264	1.264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

Where :

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

ΔD = Maximum distance between any two diameters, must be $\leq$ 0.100 mm.

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



Calibrated by : Saksit Phaisanphisut
(Mr.Saksit Phaisanphisut)
Field Scientist (4)

Approved by : Wichan Choonharat
Mr.Wichan Choonharat
Manager

Form No. QI 281-025 (13/01/03)

Lot No. 2226671-1

ANALYZER CALIBRATION DATA

Client : Global Power Synergy PCL.
Date : 26 Apr 22
Location : HRSG 1
Test Operator : Saksit P.

O_2 ANALYZER
Model : TELEDYNE API 200EH
Span (%) : 25
Serial No. : 549

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	-0.03	0.00	0.12
Low-Level Gas	7.93	7.90	7.93	0.12
Span Gas	16.00	15.97	16.00	0.12

NO_x ANALYZER
Model : TELEDYNE API 200EH
Span (ppm) : 100
Serial No. : 549

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.04	-0.01	0.03
Low-Level Gas	50.41	50.37	50.40	0.03
Span Gas	80.27	80.23	80.26	0.03

SO2 ANALYZER
Model : TELEDYNE API 100EH
Span (ppm) : 100
Serial No. : 282

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.01	0.00	0.01
Low-Level Gas	51.61	51.60	51.61	0.01
Span Gas	79.00	78.99	79.00	0.01

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

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.01	0.00	0.01
Low-Level Gas	50.31	50.32	50.31	0.01
Span Gas	80.53	80.54	80.53	0.01

Calibrated by

(Mr. Saksit Phaisanphisut)
Environmental Field Scientst (4)

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

Lot No. 2226671-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Global Power Synergy PCL. Location : HRSG 1
Date : 26 Apr 22 Test Operator : Saksit P.

O_2 ANALYZER
Cylinder Conc. (%) : 16.00 Span (%) : 25

	O_2 Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.03	-0.03	0.00	0.00	0.12	0.12
Upscale Gas	15.97	15.97	0.00	16.00	0.12	0.12

NO_X ANALYZER
Cylinder Conc. (ppm) : 80.27 Span (ppm) : 100

	NO_X Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.04	-0.04	0.00	-0.01	0.03	0.03
Upscale Gas	80.23	80.23	0.00	80.26	0.03	0.03

SO_2 ANALYZER
Cylinder Conc. (ppm) : 79.00 Span (ppm) : 100

	SO_2 Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.01	-0.01	0.00	0.00	0.01	0.01
Upscale Gas	78.99	78.99	0.00	79.00	0.01	0.01

CO ANALYZER
Cylinder Conc. (ppm) : 80.53 Span (ppm) : 100

	CO Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.01	0.01	0.00	0.00	0.01	0.01
Upscale Gas	80.54	80.54	0.00	80.53	0.01	0.01

Calibrated by

(Mr. Saksit Phaisanphisut)

Environmental Field Scientist (4)

EMISSION TEST RESULT

Client Global Power Synergy PCL.
Date 26 Apr 22
Start Time 10:20
SO_2 Analyzer Model TELEDYNE API 100EH
NO_x/O_2 Analyzer Model TELEDYNE API 200EH
CO/CO_2 Analyzer Model TELEDYNE API 300EM

Run # 1
Location HRSG 1
Test Operator Saksit P.
Finish Time 10:40
Serial No. 282
Serial No. 549
Serial No. 300

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
10:20	13.11	4.53	13.58	0.11	9.53	
10:21	13.10	4.52	13.15	0.09	9.69	
10:22	13.08	4.54	12.92	0.08	9.58	
10:23	13.01	4.51	12.80	0.08	8.99	
10:24	13.00	4.55	12.88	0.09	8.74	
10:25	12.99	4.57	12.85	0.09	8.93	
10:26	12.96	4.55	12.72	0.09	8.65	
10:27	12.94	4.64	12.72	0.09	8.49	
10:28	12.89	4.66	12.79	0.08	8.53	
10:29	12.87	4.67	12.69	0.07	8.53	
10:30	12.87	4.68	12.69	0.06	8.58	
10:31	12.80	4.73	12.58	0.08	8.67	
10:32	12.75	4.76	12.60	0.08	8.64	
10:33	12.75	4.72	12.67	0.09	8.36	
10:34	12.74	4.69	12.78	0.08	8.23	
10:35	12.74	4.66	12.82	0.08	8.41	
10:36	12.73	4.71	12.70	0.07	8.32	
10:37	12.73	4.70	12.65	0.09	8.41	
10:38	12.74	4.68	12.56	0.10	8.70	
10:39	12.73	4.72	12.48	0.08	8.47	
10:40	12.73	4.67	12.50	0.09	8.22	
Average	12.87	4.64	12.76	0.08	8.71	

(Mr. Saksit Phaisanphisut)

Environmental Field Scientist (4)

EMISSION TEST RESULT

Client Global Power Synergy PCL.
Date 26 Apr 22
Start Time 10:41
SO_2 Analyzer Model TELEDYNE API 100EH
NO_x/O_2 Analyzer Model TELEDYNE API 200EH
CO/CO_2 Analyzer Model TELEDYNE API 300EM

Run # 2
Location HRSG 1
Test Operator Saksit P.
Finish Time 11:01
Serial No. 282
Serial No. 549
Serial No. 300

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
10:41	12.74	4.72	12.60	0.06	8.73	
10:42	12.73	4.71	12.58	0.08	9.20	
10:43	12.72	4.71	12.48	0.09	8.58	
10:44	12.72	4.70	12.32	0.08	8.71	
10:45	12.72	4.73	12.19	0.10	8.57	
10:46	12.74	4.66	12.26	0.10	8.28	
10:47	12.74	4.73	12.39	0.07	8.36	
10:48	12.74	4.75	12.48	0.08	8.19	
10:49	12.74	4.68	12.51	0.09	8.12	
10:50	12.76	4.68	12.59	0.09	8.53	
10:51	12.73	4.72	12.57	0.09	8.53	
10:52	12.67	4.76	12.63	0.07	8.39	
10:53	12.66	4.77	12.77	0.10	8.48	
10:54	12.62	4.78	12.90	0.08	8.46	
10:55	12.61	4.77	12.89	0.08	8.73	
10:56	12.62	4.74	12.93	0.08	8.75	
10:57	12.61	4.75	12.84	0.08	9.00	
10:58	12.62	4.74	12.89	0.08	8.96	
10:59	12.61	4.76	12.52	0.07	8.96	
11:00	12.62	4.76	12.97	0.09	8.64	
11:01	12.66	4.75	13.10	0.09	8.76	
Average	12.68	4.73	12.65	0.08	8.54	

(Mr. Saksit Phaisanphisut)

Environmental Field Scientist (4)

EMISSION TEST RESULT

Client Global Power Synergy PCL.
Date 26 Apr 22
Start Time 11:02
SO_2 Analyzer Model TELEDYNE API 100EH
NO_x/O_2 Analyzer Model TELEDYNE API 200EH
CO/CO_2 Analyzer Model TELEDYNE API 300EM

Run # 3
Location HRSG 1
Test Operator Saksit P.
Finish Time 11:22
Serial No. 282
Serial No. 549
Serial No. 300

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
11:02	12.62	4.81	13.14	0.07	8.89	
11:03	12.61	4.76	13.12	0.10	8.88	
11:04	12.61	4.81	13.10	0.11	8.73	
11:05	12.62	4.85	13.06	0.09	8.61	
11:06	12.63	4.84	13.19	0.10	8.83	
11:07	12.64	4.78	13.36	0.10	8.82	
11:08	12.62	4.77	13.52	0.10	8.61	
11:09	12.62	4.79	13.53	0.08	8.57	
11:10	12.62	4.76	13.51	0.10	8.53	
11:11	12.63	4.79	13.65	0.09	8.56	
11:12	12.64	4.73	13.89	0.09	8.45	
11:13	12.64	4.85	13.97	0.09	8.37	
11:14	12.65	4.75	13.94	0.10	8.41	
11:15	12.61	4.80	13.90	0.10	8.66	
11:16	12.57	4.80	13.97	0.11	9.20	
11:17	12.55	4.86	13.98	0.10	9.08	
11:18	12.56	4.76	14.12	0.09	8.61	
11:19	12.55	4.86	14.17	0.10	8.71	
11:20	12.54	4.90	14.13	0.08	9.04	
11:21	12.54	4.86	14.07	0.09	8.62	
11:22	12.54	4.81	14.02	0.09	8.96	
Average	12.60	4.80	13.68	0.09	8.73	

(Mr. Saksit Phaisanphisut)

Environmental Field Scientist (4)

Lot No. 2226673-1

ANALYZER CALIBRATION DATA

Client : Global Power Synergy PCL. Location : HRSG 2
Date : 27 Apr 22 Test Operator : Saksit P.

O_2 ANALYZER
Model : TELEDYNE API 200EH Serial No. : 549
Span (%) : 25

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	-0.02	0.00	0.08
Low-Level Gas	7.93	7.91	7.93	0.08
Span Gas	16.00	15.98	16.00	0.08

NO_x ANALYZER
Model : TELEDYNE API 200EH Serial No. : 549
Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.04	-0.01	0.03
Low-Level Gas	50.41	50.37	50.40	0.03
Span Gas	80.27	80.23	80.26	0.03

SO2 ANALYZER
Model : TELEDYNE API 100EH Serial No. : 282
Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.01	0.00	0.01
Low-Level Gas	51.61	51.60	51.61	0.01
Span Gas	79.00	78.99	79.00	0.01

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

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.01	0.00	0.01
Low-Level Gas	50.31	50.32	50.31	0.01
Span Gas	80.53	80.54	80.53	0.01

Calibrated by

(Mr. Saksit Phaisanphisut)
Environmental Field Scientist (4)

Lot No. 2226673-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Global Power Synergy PCL. Location : HRSG 2
Date : 27 Apr 22 Test Operator : Saksit P.

O_2 ANALYZER
Cylinder Conc. (%) : 16.00 Span (%) : 25

	O_2 Analyzer Calbration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.02	-0.02	0.00	0.00	0.08	0.08
Upscale Gas	15.98	15.98	0.00	16.00	0.08	0.08

NO_x ANALYZER
Cylinder Conc. (ppm) : 80.27 Span (ppm) : 100

	NO_x Analyzer Calbration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.04	-0.04	0.00	-0.01	0.03	0.03
Upscale Gas	80.23	80.23	0.00	80.26	0.03	0.03

SO_2 ANALYZER
Cylinder Conc. (ppm) : 79.00 Span (ppm) : 100

	SO_2 Analyzer Calbration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.01	-0.01	0.00	0.00	0.01	0.01
Upscale Gas	78.99	78.99	0.00	79.00	0.01	0.01

CO ANALYZER
Cylinder Conc. (ppm) : 80.53 Span (ppm) : 100

	CO Analyzer Calbration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.01	0.01	0.00	0.00	0.01	0.01
Upscale Gas	80.54	80.54	0.00	80.53	0.01	0.01

Calibrated by

(Mr. Saksit Phaisanphisut)
Environmental Field Scientist (4)

EMISSION TEST RESULT

Client : Global Power Synergy PCL. Run # : 1
Date : 27 Apr 22 Location : HRSG 2
Start Time : 10:00 Test Operator : Saksit P.
SO_2 Analyzer Model : TELEDYNE API 100EH Finish Time : 10:20
NO_x/O_2 Analyzer Model : TELEDYNE API 200EH Serial No. : 282
CO/CO_2 Analyzer Model : TELEDYNE API 300EM Serial No. : 549
Serial No. : 300

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
10:00	13.76	4.16	7.41	0.09	23.26	
10:01	13.75	4.15	7.43	0.11	23.54	
10:02	13.76	4.18	7.45	0.12	23.39	
10:03	13.76	4.20	7.47	0.13	22.95	
10:04	13.75	4.19	7.49	0.12	23.26	
10:05	13.74	4.16	7.46	0.10	23.61	
10:06	13.74	4.19	7.41	0.13	23.64	
10:07	13.74	4.15	7.33	0.12	23.02	
10:08	13.75	4.17	7.34	0.12	23.00	
10:09	13.75	4.17	7.31	0.14	23.48	
10:10	13.75	4.16	7.30	0.12	23.43	
10:11	13.76	4.17	7.33	0.11	22.75	
10:12	13.76	4.20	7.40	0.11	22.85	
10:13	13.76	4.16	7.35	0.10	22.92	
10:14	13.77	4.11	7.30	0.09	23.19	
10:15	13.77	4.17	7.38	0.13	23.26	
10:16	13.76	4.14	7.39	0.11	23.37	
10:17	13.76	4.22	7.36	0.13	23.17	
10:18	13.73	4.17	7.37	0.11	22.63	
10:19	13.66	4.20	7.44	0.11	20.45	
10:20	13.59	4.24	7.49	0.11	18.55	
Average	13.74	4.17	7.39	0.11	22.84	

(Mr. Saksit Phaisanphisut)
Environmental Field Scientist (4)

EMISSION TEST RESULT

Client : Global Power Synergy PCL. Run # : 2
Date : 27 Apr 22 Location : HRSG 2
Start Time : 10:21 Test Operator : Saksit P.
SO_2 Analyzer Model : TELEDYNE API 100EH Finish Time : 10:41
NO_x/O_2 Analyzer Model : TELEDYNE API 200EH Serial No. : 282
CO/CO_2 Analyzer Model : TELEDYNE API 300EM Serial No. : 549
Serial No. : 300

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
10:21	13.53	4.28	7.70	0.13	16.85	
10:22	13.51	4.29	7.86	0.10	19.07	
10:23	13.48	4.32	8.01	0.12	15.47	
10:24	13.41	4.34	8.21	0.13	13.42	
10:25	13.35	4.36	8.42	0.10	12.61	
10:26	13.34	4.34	8.63	0.10	11.96	
10:27	13.30	4.39	8.74	0.11	11.40	
10:28	13.30	4.42	8.87	0.13	10.96	
10:29	13.29	4.41	8.95	0.12	10.71	
10:30	13.28	4.38	8.93	0.12	11.01	
10:31	13.27	4.30	8.86	0.11	10.52	
10:32	13.25	4.45	8.96	0.10	9.76	
10:33	13.22	4.46	9.07	0.10	9.25	
10:34	13.22	4.42	9.14	0.15	9.11	
10:35	13.21	4.46	9.22	0.13	9.21	
10:36	13.20	4.46	9.23	0.11	9.18	
10:37	13.21	4.47	9.22	0.13	9.06	
10:38	13.22	4.45	9.16	0.12	8.75	
10:39	13.21	4.39	9.17	0.11	9.14	
10:40	13.19	4.45	9.20	0.11	8.65	
10:41	13.18	4.47	9.33	0.13	7.72	
Average	13.29	4.40	8.80	0.11	11.00	

(Mr. Saksit Phaisanphisut)
Environmental Field Scientist (4)

EMISSION TEST RESULT

Client	Global Power Synergy PCL.	Run #	3
Date	27 Apr 22	Location	HRSG 2
Start Time	10:42	Test Operator	Saksit P.
SO_2 Analyzer Model	TELEDYNE API 100EH	Finish Time	11:02
NO_x/O_2 Analyzer Model	TELEDYNE API 200EH	Serial No.	282
CO/CO_2 Analyzer Model	TELEDYNE API 300EM	Serial No.	549
		Serial No.	300

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
10:42	13.10	4.52	9.66	0.12	7.36	
10:43	13.06	4.49	9.88	0.16	7.19	
10:44	13.05	4.52	10.04	0.16	7.23	
10:45	13.04	4.57	10.22	0.11	7.20	
10:46	13.03	4.50	10.44	0.11	7.09	
10:47	13.03	4.54	10.53	0.10	7.25	
10:48	13.04	4.52	10.48	0.10	6.82	
10:49	13.05	4.49	10.48	0.11	7.04	
10:50	13.05	4.52	10.58	0.13	6.97	
10:51	13.04	4.61	10.61	0.11	7.01	
10:52	13.03	4.61	10.61	0.12	7.38	
10:53	13.04	4.56	10.59	0.15	7.56	
10:54	13.05	4.58	10.57	0.14	7.37	
10:55	13.05	4.54	10.56	0.13	7.38	
10:56	13.05	4.56	10.59	0.12	7.29	
10:57	13.05	4.54	10.60	0.11	7.04	
10:58	13.05	4.55	10.56	0.10	7.10	
10:59	13.05	4.59	10.59	0.11	7.14	
11:00	13.05	4.57	10.56	0.21	7.53	
11:01	13.06	4.55	10.44	0.16	7.69	
11:02	13.06	4.55	10.33	0.11	7.38	
Average	**13.05**	**4.54**	**10.42**	**0.12**	**7.24**	

Saksit P.

(Mr. Saksit Phaisanphisut)

Environmental Field Scientist (4)

Lot No. 2226679-1

ANALYZER CALIBRATION DATA

Client	: Global Power Synergy PCL.	Location	: Auxilliary Boiler
Date	: 28 Apr 22	Test Operator	: Saksit P.

O_2 ANALYZER

Model : TELEDYNE API 200EH Serial No. : 549

Span (%) : 25

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	-0.01	0.00	0.04
Low-Level Gas	7.93	7.92	7.93	0.04
Span Gas	16.00	15.99	16.00	0.04

NO_x ANALYZER

Model : TELEDYNE API 200EH Serial No. : 549

Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.03	0.00	0.03
Low-Level Gas	50.41	50.44	50.41	0.03
Span Gas	80.27	80.30	80.27	0.03

SO2 ANALYZER

Model : TELEDYNE API 100EH Serial No. : 282

Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	-0.01	0.00	0.01
Low-Level Gas	51.61	51.60	51.61	0.01
Span Gas	79.00	78.99	79.00	0.01

CO ANALYZER

Model : TELEDYNE API 300EM Serial No. : 300

Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.01	0.00	0.01
Low-Level Gas	50.31	50.32	50.31	0.01
Span Gas	80.53	80.54	80.53	0.01

Calibrated by

Saksit P.

(Mr. Saksit Phaisanphisut)

Environmental Field Scientst (4)

Lot No. 2226679-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client	: Global Power Synergy PCL.	Location	: Auxilliary Boiler
Date	: 28 Apr 22	Test Operator	: Saksit P.

O_2 ANALYZER

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

	O_2 Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.01	-0.01	0.00	0.00	0.04	0.04
Upscale Gas	15.99	15.99	0.00	16.00	0.04	0.04

NO_x ANALYZER

Cylinder Conc. (ppm) : 80.27 Span (ppm) : 100

	NO_x Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.03	0.03	0.00	0.00	0.03	0.03
Upscale Gas	80.30	80.30	0.00	80.27	0.03	0.03

SO_2 ANALYZER

Cylinder Conc. (ppm) : 79.00 Span (ppm) : 100

	SO_2 Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	-0.01	-0.01	0.00	0.00	0.01	0.01
Upscale Gas	78.99	78.99	0.00	79.00	0.01	0.01

CO ANALYZER

Cylinder Conc. (ppm) : 80.53 Span (ppm) : 100

	CO Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.01	0.01	0.00	0.00	0.01	0.01
Upscale Gas	80.54	80.54	0.00	80.53	0.01	0.01

Calibrated by

Saksit P.

(Mr. Saksit Phaisanphisut)

Environmental Field Scientist (4)

EMISSION TEST RESULT

Client	Global Power Synergy PCL.	Run #	1
Date	28 Apr 22	Location	Auxilliary Boiler
Start Time	10:10	Test Operator	Saksit P.
SO_2 Analyzer Model	TELEDYNE API 100EH	Finish Time	10:30
NO_x/O_2 Analyzer Model	TELEDYNE API 200EH	Serial No.	282
CO/CO_2 Analyzer Model	TELEDYNE API 300EM	Serial No.	549
		Serial No.	300

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
10:10	3.83	9.78	41.72	0.14	0.31	
10:11	3.73	9.81	41.86	0.15	0.22	
10:12	3.71	9.80	41.99	0.14	0.18	
10:13	3.68	9.75	42.00	0.16	0.23	
10:14	3.69	9.84	42.00	0.14	0.11	
10:15	3.69	9.73	42.08	0.17	0.07	
10:16	3.67	9.85	42.14	0.16	0.07	
10:17	3.63	9.78	42.24	0.17	0.05	
10:18	3.66	9.84	42.20	0.17	0.15	
10:19	3.66	9.83	42.25	0.17	0.28	
10:20	3.59	9.88	42.47	0.17	0.22	
10:21	3.64	9.79	42.54	0.19	0.22	
10:22	3.70	9.81	42.52	0.18	0.27	
10:23	3.64	9.79	42.59	0.17	0.28	
10:24	3.69	9.81	42.54	0.17	0.31	
10:25	3.73	9.89	42.32	0.18	0.40	
10:26	3.75	9.74	42.22	0.16	0.40	
10:27	3.76	9.77	42.31	0.18	0.23	
10:28	3.75	9.91	42.42	0.16	0.30	
10:29	3.65	9.71	42.26	0.15	0.31	
10:30	3.63	9.72	42.14	0.15	0.20	
Average	**3.71**	**9.79**	**42.22**	**0.16**	**0.23**	

Saksit P.

(Mr. Saksit Phaisanphisut)

Environmental Field Scientist (4)

EMISSION TEST RESULT

Client	Global Power Synergy PCL.	Run #	2
Date	28 Apr 22	Location	Auxilliary Boiler
Start Time	10:31	Test Operator	Saksit P.
SO_2 Analyzer Model	TELEDYNE API 100EH	Finish Time	10:51
NO_x/O_2 Analyzer Model	TELEDYNE API 200EH	Serial No.	282
CO/CO_2 Analyzer Model	TELEDYNE API 300EM	Serial No.	549
		Serial No.	300

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
10:31	3.81	9.73	41.89	0.15	0.31	
10:32	3.82	9.73	41.81	0.15	0.39	
10:33	3.84	9.76	41.70	0.15	0.40	
10:34	3.86	9.87	41.64	0.14	0.38	
10:35	3.91	9.61	41.56	0.14	0.27	
10:36	3.98	9.62	41.45	0.15	0.47	
10:37	4.04	9.64	41.34	0.14	0.41	
10:38	4.08	9.56	41.27	0.16	0.47	
10:39	3.74	9.86	41.38	0.16	0.30	
10:40	3.53	9.94	41.82	0.16	0.23	
10:41	3.51	9.86	42.00	0.14	0.18	
10:42	3.49	9.89	42.21	0.15	0.27	
10:43	3.50	9.93	42.18	0.17	0.17	
10:44	3.47	9.99	42.01	0.17	0.03	
10:45	3.44	10.01	42.32	0.15	0.08	
10:46	3.43	9.97	42.59	0.18	0.33	
10:47	3.44	9.95	42.69	0.15	0.32	
10:48	3.45	9.96	42.56	0.15	0.09	
10:49	3.44	9.92	42.59	0.16	0.22	
10:50	3.46	9.96	42.48	0.15	0.16	
10:51	3.50	9.91	42.65	0.17	0.09	
Average	3.85	9.84	42.01	0.15	0.26	

Saksit P.

(Mr. Saksit Phaisanphisut)

Environmental Field Scientist (4)

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

ALS Laboratory Group

EMISSION TEST RESULT

Client	Global Power Synergy PCL.	Run #	3
Date	28 Apr 22	Location	Auxilliary Boiler
Start Time	10:52	Test Operator	Saksit P.
SO_2 Analyzer Model	TELEDYNE API 100EH	Finish Time	11:12
NO_x/O_2 Analyzer Model	TELEDYNE API 200EH	Serial No.	282
CO/CO_2 Analyzer Model	TELEDYNE API 300EM	Serial No.	549
		Serial No.	300

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
10:52	3.49	9.94	42.59	0.17	0.12	
10:53	3.51	9.89	42.59	0.17	0.16	
10:54	3.55	9.79	42.67	0.16	0.08	
10:55	3.60	9.85	42.64	0.15	0.13	
10:56	3.63	9.90	42.72	0.16	0.25	
10:57	3.67	9.78	42.78	0.14	0.22	
10:58	3.73	9.71	42.80	0.16	0.20	
10:59	3.77	9.71	42.91	0.13	0.12	
11:00	3.78	9.72	42.97	0.16	0.31	
11:01	3.81	9.75	42.80	0.14	0.24	
11:02	3.86	9.66	42.56	0.16	0.42	
11:03	3.91	9.64	42.37	0.16	0.29	
11:04	3.95	9.60	42.36	0.15	0.39	
11:05	4.04	9.58	42.16	0.14	0.43	
11:06	4.07	9.49	41.86	0.15	0.36	
11:07	3.93	9.74	41.95	0.15	0.22	
11:08	3.65	9.70	42.29	0.10	0.29	
11:09	3.83	9.62	42.48	0.15	0.13	
11:10	3.82	9.59	42.32	0.15	0.16	
11:11	3.82	9.64	42.17	0.17	0.30	
11:12	3.90	9.63	42.21	0.14	0.37	
Average	3.79	9.71	42.48	0.15	0.25	

Saksit P.

(Mr. Saksit Phaisanphisut)

Environmental Field Scientist (4)

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

ALS Laboratory Group

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E04NI88E3HA0023	Reference Number:	82-401123195-1
Cylinder Number:	ND33003	Cylinder Volume:	247.2 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2215 PSIG
PGVP Number:	B52018	Valve Outlet:	660
Gas Code:	CO,NO,NOX,SO2,BALN	Certification Date:	Feb 26, 2018

Expiration Date: Feb26, 2026

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

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

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	50.00 PPM	50.44 PPM	G1	+/-1.0% NIST Traceable	02/20/2018, 02/26/2018
CARBON MONOXIDE	50.00 PPM	50.33 PPM	G1	+/-0.2% NIST Traceable	02/19/2018
NITRIC OXIDE	50.00 PPM	50.39 PPM	G1	+/-1.0% NIST Traceable	02/19/2018, 02/26/2018
SULFUR DIOXIDE	50.00 PPM	51.61 PPM	G1	+/-1.0% NIST Traceable	02/19/2018, 02/26/2018
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	14092758	CC434353	49.88 PPM CARBON MONOXIDE/NITROGEN	+/-0.6%	Feb 22, 2022
PRM	12387	APEX1498357	9.82 PPM NITROGEN DIOXIDE/AIR	+/-2.0%	Jun 02, 2017
NTRM	16030307	CC447364	50.42 PPM NITRIC OXIDE/NITROGEN	+/-0.8%	Jun 27, 2025
GMIS	SI145201634	CC433366	4.972 PPM NITROGEN DIOXIDE/NITROGEN	+/-1.6%	May 18, 2018
NTRM	16011628	CC472216	49.63 PPM SULFUR DIOXIDE/NITROGEN	+/-0.8%	Jun 07, 2022

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

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Model 6700 APW1102391 CO	ETIR	Feb 08, 2018
Model 6700 APW1102391 NO	FTIR	Feb 15, 2018
Model 6700 APW1102391 NOX	FTIR	Feb 16, 2018
Model 6700 APW1102391 SO2	FTIR	Feb 05, 2018

Triad Data Available Upon Request

NOTES:

This calibration std. has been certified in accordance with the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531. All testing processes and measurements conform to the requirements of ISO/IEC 17025 and to Airgas ISO 9001:2000 and relate only to items identified on this certificate. The results are certified to be NIST Traceable with total uncertainty as detailed under Analytical Uncertainty. This document shall not be reproduced in full without written approval of the issuer.

ACCREDITED

TESTING CERT No. 3082.05

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
6141 Easton Road
Bldg 1
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E04NI99E15A0440	Reference Number:	160-401907847-1
Cylinder Number:	EE0137377	Cylinder Volume:	144.4 Cubic Feet
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2015 PSIG
PGVP Number:	A12020	Valve Outlet:	660
Gas Code:	CO,NO,NOX,SO2,BALN	Certification Date:	Oct 06, 2020

Expiration Date: Oct 06, 2028

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

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

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	80.00 PPM	80.27 PPM	G1	+/- 1.4% NIST Traceable	09/29/2020, 10/06/2020
CARBON MONOXIDE	80.00 PPM	80.53 PPM	G1	+/- 1.0% NIST Traceable	09/29/2020
NITRIC OXIDE	80.00 PPM	80.27 PPM	G1	+/- 1.4% NIST Traceable	09/29/2020, 10/06/2020
SULFUR DIOXIDE	80.00 PPM	79.00 PPM	G1	+/- 1.0% NIST Traceable	09/29/2020, 10/06/2020
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	11010139	KAL004536	97.51 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%	Oct 04, 2022
PRM	12386	D668925	9.91 PPM AIR/NITROGEN DIOXIDE	2.0%	Feb 20, 2020
NTRM	17060220	EB0079109	100.3 PPM NITRIC OXIDE/NITROGEN	+/- 1.0%	Jul 23, 2023
GMIS	124306869	CC323707	4.028 PPM NITROGEN DIOXIDE/NITROGEN	2.1%	Aug 19, 2021
NTRM	17060223	EB0079116	100.6 PPM NOx/NITROGEN	+/- 1.0%	Jul 23, 2023
NTRM	16010235	KAL004419	97.69 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Dec 23, 2021
NTRM	11810410	KAL004502	99.0 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Jul 28, 2027

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

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet IS50 FTIR AUP2010045 CO	FTIR	Sep 21, 2020
Nicolet IS50 FTIR AUP2010045 NO	FTIR	Sep 14, 2020
Nicolet IS50 FTIR AUP2010045 NO2	FTIR	Sep 22, 2020
Nicolet IS50 FTIR AUP2010045 SO2	FTIR	Sep 16, 2020

Triad Data Available Upon Request

NOTES: Gross Weight: 27.4 Kg. Net Weight: 4.8 Kg.

Approved for Release

THE LINDE GROUP

Linde

CERTIFICATE OF ANALYSIS

Customer Detail:
ALS Laboratory Group (Thailand)

Cylinder Description:
Steel 47 L

Production Order Number: **90132928**
Material Number: **478100-J-44**
Certification Date: **20-Jan-2016**
Expiry Date: **20-Jan-2024**

The measurement of this reference material is traceable to SI through the reference standard which is traceable to Swiss National Standard of Mass. The Assay of this Standard has been performed in accordance with the EPA Traceability Protocol EPA-600/R-12/531 for the Assay and Certification of Gaseous Calibration Standards using procedure G1. The results are expressed on a mole/mole basis, unless otherwise specified. The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k=2, providing a level of confidence of approximately 95%.

Certificate Number: **4676/15**

Analyst: THITIRAT LOYRAT

Cylinder Number: **550730**

Nominal Cylinder Content: **6.520 M³**

Approve: SUKANYA KAMUTHARAT

Nominal Pressure: **145.0 Bar**

Valve Outlet: **CGA 590 BRASS**

To Re-Order Please Quote: **478100-J-44**

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

บริษัท ลินเด้ (ประเทศไทย) จำกัด (มหาชน)
Linde (Thailand) Public Company Limited

THE LINDE GROUP

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CERTIFICATE OF ANALYSIS

Analytical Result

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

Reference Standard used in Assay

Reference Standard	Cylinder No.	Concentration	Expired Date
Oxygen in Nitrogen	243625SG	25.08 ± 0.13 %	19-Aug-2017

Analytical Instruments used in Assay

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

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

Cylinder Number: **550730**
Production Order Number: **90132928**

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

THE LINDE GROUP

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CERTIFICATE OF ANALYSIS

Customer Detail:
ALS Laboratory Group (Thailand)

Cylinder Description:
STEEL 47 L

Production Order Number: **90137389**
Material Number: **557200-J-44**
Certification Date: **24-Sep-2016**
Expiry Date: **24-Sep-2024**

The measurement of this reference material is traceable to SI through the reference standard which is traceable to Swiss National Standard of Mass. The Assay of this Standard has been performed in accordance with the EPA Traceability Protocol EPA-600/R-12/531 for the Assay and Certification of Gaseous Calibration Standards using procedure G1. The results are expressed on a mole/mole basis, unless otherwise specified. The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k=2, providing a level of confidence of approximately 95%.

Certificate Number: **2857/16**

Analyst: THITIRAT LOYRAT

Cylinder Number: **363075**

Nominal Cylinder Content: **6.560 M³**

Approve: SUKANYA KAMUTHARAT

Nominal Pressure: **145.0 Bar**

Valve Outlet: **CGA 590 BRASS**

To Re-Order Please Quote: **557200-J-44**

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

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Linde (Thailand) Public Company Limited

THE LINDE GROUP

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CERTIFICATE OF ANALYSIS

Analytical Result

Component	Request Concentration	Certified Concentration	Certified Uncertainty	Method	Assay Date
Oxygen in Nitrogen	16.0 %	16.0 %	+/-1% relative	(2) I-PB-354	24-Sep-2016

Reference Standard used in Assay

Reference Standard	Cylinder No.	Concentration	Expired Date
Oxygen in Nitrogen	243625SG	25.08 ± 0.13 %	19-Aug-2017

Analytical Instruments used in Assay

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

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

Cylinder Number: **363075**
Production Order Number: **90137389**

Certification Date: **24-Sep-2016**
Expiration Date: **24-Sep-2024**

บริษัท ลินเด้ (ประเทศไทย) จำกัด (มหาชน)
Linde (Thailand) Public Company Limited

ROTA METER CALIBRATION RESULT JANUARY 2022

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R^2)
BKK_FS0577	05 Jan 22	Y = 0.9899x + 0.9112	0.9999
BKK_FS0579	05 Jan 22	Y = 1.007x - 0.0299	1.0000
BKK_FS0583	05 Jan 22	Y = 1.0513x + 1.869	0.9967
BKK_FS0584	05 Jan 22	Y = 1.0048x - 1.069	1.0000
BKK_FS0585	05 Jan 22	Y = 1.0076x - 1.1036	0.9999
BKK_FS0586	05 Jan 22	Y = 0.9933x + 3.2655	1.0000
BKK_FS0587	05 Jan 22	Y = 1.0401x - 17.457	0.9996
BKK_FS0588	05 Jan 22	Y = 1.0154x + 4.8357	0.9999
BKK_FS0589	05 Jan 22	Y = 0.9918x + 4.8069	0.9999
BKK_FS0590	05 Jan 22	Y = 0.9861x + 10.07	0.9995
BKK_FS0591	05 Jan 22	Y = 1.0117x - 92.415	0.9995
BKK_FS0592	05 Jan 22	Y = 1.0031x - 69.305	0.9996
BKK_FS0593	05 Jan 22	Y = 1.0131x - 98.198	0.9996
BKK_FS0594	05 Jan 22	Y = 1.0075x - 7.0829	0.9999
BKK_FS0595	05 Jan 22	Y = 1.0249x - 98.162	0.9999
BKK_FS0596	05 Jan 22	Y = 0.9843x - 26.806	0.9991
BKK_FS0597	05 Jan 22	Y = 1.0203x - 122.14	0.9999
BKK_FS1004	04 Jan 22	Y = 0.9651x + 19.648	0.9989
BKK_FS1005	04 Jan 22	Y = 1.0096x + 4.6643	0.9997
BKK_FS1006	04 Jan 22	Y = 1.2188x - 7.1214	0.9994
BKK_FS1007	05 Jan 22	Y = 1.0563x - 1.0912	1.0000
BKK_FS1008	05 Jan 22	Y = 0.9689x + 1.9061	1.0000
BKK_FS1009	05 Jan 22	Y = 1.0132x + 1.1633	0.9960
BKK_FS1010	05 Jan 22	Y = 1.0033x + 0.5758	0.9999
BKK_FS1014	05 Jan 22	Y = 1.0021x + 0.3148	0.9998
BKK_FS1015	05 Jan 22	Y = 0.9994x + 1.786	1.0000
BKK_FS1016	05 Jan 22	Y = 1.0105x - 80.256	0.9998
BKK_FS1017	05 Jan 22	Y = 0.9995x + 0.649	1.0000
BKK_FS1018	05 Jan 22	Y = 1.0011x + 1.1786	1.0000
BKK_FS1019	05 Jan 22	Y = 1.0023x - 68.424	0.9996
BKK_FS1020	05 Jan 22	Y = 0.9887x + 2.8844	0.9999
BKK_FS1021	05 Jan 22	Y = 0.9659x + 1.4905	0.9978
BKK_FS1022	05 Jan 22	Y = 1.022x - 17.957	0.9997
BKK_FS1023	05 Jan 22	Y = 1.0094x + 0.0717	0.9999
BKK_FS1024	05 Jan 22	Y =1.0042x + 0.4086	0.9997
BKK_FS1025	05 Jan 22	Y = 1.0132x - 88.507	0.9996
BKK_FS1026	05 Jan 22	Y = 0.9902x + 0.9554	1.0000
BKK_FS1027	05 Jan 22	Y = 1.0086x - 2.279	1.0000
BKK_FS1028	05 Jan 22	Y = 1.0105x - 81.055	0.9997

ROTA METER CALIBRATION RESULT JANUARY 2022

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R^2)
BKK_FS1029	05 Jan 22	Y = 0.9935x + 0.8234	1.0000
BKK_FS1030	05 Jan 22	Y = 1.0039x + 0.515	0.9999
BKK_FS1031	05 Jan 22	Y = 1.009x - 79.295	0.9998
BKK_FS1039	04 Jan 22	Y = 0.9916x + 6.1524	0.9988
BKK_FS1040	04 Jan 22	Y = 1.0133x - 10.177	0.9985
BKK_FS1041	04 Jan 22	Y = 1.0805x - 1.7381	0.9998
BKK_FS1042	04 Jan 22	Y = 1.0061x + 1.3405	0.9994
BKK_FS1043	04 Jan 22	Y = 1.0112x - 10.393	0.9999
BKK_FS1044	04 Jan 22	Y = 1.0495x - 1.0136	0.9996
BKK_FS1161	05 Jan 22	Y = 0.9812x + 15571	1.0000
BKK_FS1162	05 Jan 22	Y = 0.9932x + 5.0014	0.9997
BKK_FS1163	05 Jan 22	Y = 1.0082x - 82.062	0.9998
BKK_FS1164	05 Jan 22	Y = 0.9914x + 0.8427	0.9997
BKK_FS1165	05 Jan 22	Y = 0.9893x + 6.5919	0.9998
BKK_FS1166	05 Jan 22	Y = 1.0031x - 77.881	0.9998
RYG_FS0197	04 Jan 22	Y = 1.0068x + 1.7152	0.9998
RYG_FS0198	04 Jan 22	Y = 0.9986x + 18.196	0.9995
RYG_FS0199	04 Jan 22	Y = 1.1202x - 3.5782	0.9999

Review By : (Mr. Wichan Choonharat) Enviro Field Services Manager

Approved By : (Mr.Sarayuth Jittranont) Assistant General Manager

SPC Calibration Center

Part of DKSH Grou

Certificate of Calibration

Equipment:	SPECTROPHOTOMETER	Certificate No.:	C06210159
Model:	DR6000	Issued Date:	01 April 2021
Serial No. (or ID.):	1627845 (RYG_EN0037)	Job No.:	KSPR2104738
Manufacturer:	HACH	Page:	1 of 3
Condition:	In Condition		

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

REVIEW BY Mr.Bamyot T.
APPROVED BY
NEXT CAL. DATE 07/10/22

Environment Condition: Temperature 25.1 °C ± 0.4 °C
Humidity 48.6 %RH ± 3.7 %RH

Calibration Place: ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch) (Wet Chemistry Lab)
616/10 Moo 5 T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand.

Calibration By: Mr. Chattuphon Folthong
Calibration Date: 01 April 2021
The Method used: In house method, SPCC-WI-24, base on ASTM E 275-08 and ASTM E 387-04
Traceability: This certificate is traceable to the CRM maintained by National Institute of Standards and Technology (NIST) through Starna Scientific Limited.

The standard for Wavelength Certificate No. 87146 and 87152
The standard for Photometric Certificate No. 87220 and 87139
The standard for Stray light Certificate No. 87163 and 87161
The standard for Spectral resolution Certificate No. 87173

(Mr. Chattuphon Folthong)
Person in charge

บริษัท เอสพีซี อาร์ที จำกัด
SPC RT Co., Ltd.

(Mr. Dumrong Boonsopon)
Authorized signatory

This certificate is issued the units of measurement according to the International System of Units (SI). It provides traceability of measurement to international or national standard or other recognized national standard laboratories.
The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM).
These results may be affected by deviations from specified conditions. The results relate only to the items tested, calibrated or sampled. The report shall not be reproduced except in full without approval of SPC RT Co., Ltd.

บริษัท เอสพีซี อาร์ที จำกัด
SPC RT CO., LTD.
1194 ซอยวชิรธรรมสาธิต 57 ถนนสุขุมวิท 101/1 แขวงบางนา เขตพระโขนง กรุงเทพมหานคร 10260
1194 Soi Wachirathammasathit 57, Sukhumvit 101/1 Road, Bangchak, Phrakhanong, Bangkok 10260 Thailand

SPC Calibration Center

Part of DKSH Grou

Calibration Results:
Without Adjustment

Wavelength Accuracy (nm), The spectral bandwidth of Std at 2 nm and UUC at 2 nm

Standard Wavelength	Unit Under Calibration	Correction	Uncertainty
410.61	410.4	0.21	0.13
536.66	536.7	-0.04	0.13
637.98	638.3	-0.32	0.14
748.48	748.7	-0.22	0.14
807.03	807.4	-0.37	0.14

Photometric Accuracy (Absorbance)

Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
420 nm	0.0000	0.000	0.0000	0.0045
	0.5890	0.590	-0.0010	0.0045
	0.7616	0.762	-0.0004	0.0045
	1.0283	1.027	-0.0007	0.0045
440 nm	0.0000	0.000	0.0000	0.0045
	0.5787	0.579	-0.0003	0.0045
	0.7442	0.744	0.0002	0.0045
	1.0039	1.004	-0.0001	0.0045
465 nm	0.0000	0.000	0.0000	0.0045
	0.5292	0.530	-0.0008	0.0045
	0.6865	0.687	-0.0005	0.0045
	0.9534	0.954	-0.0006	0.0045
546.1 nm	0.0000	0.000	0.0000	0.0045
	0.5468	0.546	0.0008	0.0045
	0.6957	0.695	0.0007	0.0045
	0.9991	0.998	0.0011	0.0045
590 nm	0.0000	0.000	0.0000	0.0045
	0.5851	0.584	0.0011	0.0045
	0.7238	0.723	0.0008	0.0045
	1.0957	1.094	0.0017	0.0045
635 nm	0.0000	0.000	0.0000	0.0045
	0.5692	0.568	0.0012	0.0045
	0.6914	0.691	0.0004	0.0045
	1.0881	1.087	0.0011	0.0045

บริษัท เอสพีซี อาร์ที จำกัด
SPC RT CO., LTD.
1194 ซอยวชิรธรรมสาธิต 57 ถนนสุขุมวิท 101/1 แขวงบางนา เขตพระโขนง กรุงเทพมหานคร 10260
1194 Soi Wachirathammasathit 57, Sukhumvit 101/1 Road, Bangchak, Phrakhanong, Bangkok 10260 Thailand

Calibration Results:

Without Adjustment

Photometric Accuracy (Absorbance)

Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
235 nm	0.0000	0.000	0.0000	0.0080
	0.7307	0.730	0.0007	0.0080
257 nm	0.0000	0.000	0.0000	0.0080
	0.8516	0.850	0.0016	0.0080
313 nm	0.0000	0.000	0.0000	0.0080
	0.2836	0.285	-0.0014	0.0080
350 nm	0.0000	0.000	0.0000	0.0080
	0.6319	0.629	0.0029	0.0080

Stray light *

Standard: cut-off	UUC: Wavelength (nm)	UUC: Transmission (%T)	Absorbance (A)
260.57 +/- 0.11 nm	260.6	1.5	1.824
392.03 +/- 0.11 nm	392.0	1.5	1.824

The stray light transmission reference is less than 1.0 T(%) and absorbance is greater than 2.0 (A)

Spectral Resolution *

Nominal Concentration 0.02 % v/v	Peak	Trough	Ratio	SBW
Standard Wavelength (nm)	268.72	266.76	1.39	2.00
UUC: Wavelength (nm)	268.2	266.1		
Std Absorbance (A)	0.4616	0.2797		
Absorbance (A)	0.416	0.300		

* Calibration Marked * Not TISI Accredited * in this Certificate have been included for completeness.

The End of Certificate

SPC Calibration Center

Part of DKSH Grou

ใบตรวจสอบสภาพเครื่องวัดสิ่งแวดล้อม

เลขที่ใบงาน: KSPR2104738

ชนิดเครื่องมือ: SPECTROPHOTOMETER รุ่น: DR6000 หมายเลขเครื่อง: 1627845

ตรวจสอบ (รับ) 01 Apr 2021 ปกติ	ตรวจสอบ (รับ) 01 Apr 2021 ไม่ปกติ	รายการตรวจเช็ค	ตรวจสอบ (ส่ง) 01 Apr 2021 ปกติ	ตรวจสอบ (ส่ง) 01 Apr 2021 ไม่ปกติ	หมายเหตุ
		General			
☑	☐	1. ความสมบูรณ์เครื่อง	☑	☐	
☑	☐	2. สาย และ ท่อ (ช่องใส่ตัวอย่าง, สายไฟ-และเครื่อง)	☑	☐	
☑	☐	3. สวิทช์ ปิด – เปิด เครื่อง (On-Off Swicth)	☑	☐	
☑	☐	4. ปุ่มกด (Keypad)	☑	☐	
☑	☐	5. หน้าจอ (Display, Screen Contrast)	☑	☐	
		Spectrophotometer			
☐	☐	6. แรงดันไฟฟ้า (Battery Backup) >= 2.5 VDC	☐	☐	
☐	☐	7. ตัวหมุนเลือกความยาวคลื่น (Wavelength Control)	☐	☐	
☑	☐	8. ความยาวคลื่น (Wavelength Check)	☑	☐	656.1=656.1 nm
☑	☐	9. แหล่งกำเนิดแสง (UV < 3,000 hour)	☑	☐	
☑	☐	10. แหล่งกำเนิดแสง (Visible < 5,000 hour)	☑	☐	
☑	☐	11. ช่องวัดหลายตัวอย่าง (Carousel Module)	☑	☐	
		pH Meter and Conductivity Meter			
☐	☐	12. อิเล็คโทรด (Electrode and Connection Cable)	☐	☐	
☐	☐	13. ระดับสารละลายใน Electrode (Level KCl)	☐	☐	
☐	☐	14. ฝาปิดกันปลาย Electrode (Dust Protection Hood)	☐	☐	
☐	☐	15. ขาจับอิเล็คโทรด (Stand)	☐	☐	
		Turbidimeter			
☐	☐	16. ค่าความขุ่นเที่ยงสุด (No Sample)	☐	☐	
☐	☐	17. ระดับการส่องสว่างของแสง (>= 2.5 ไม่เกิน 3.0)	☐	☐	
		Automatic titrator			
☐	☐	18. สภาพ Piston Burettes	☐	☐	
☐	☐	19. Function Rinsing and Dosing	☐	☐	
☐	☐	20. ระบบท่อสายยางและอุปกรณ์ประกอบ	☐	☐	

เพิ่มเติม/ข้อแนะนำ :

Mr. Chattuphon Foithong

Service Engineer

บจ. เอสพีซี อาร์ที ซำกัด
SPC RT CO., LTD.
ชาวที่ 00003 1194 ซอยวัชรธรรมสถิต 57 ถนนสุขุมวิท 101/1 แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร 10260
anch 00003 1194 Soi Wachiramhamsathit 57, Sukhumvit 101/1 Road, Bangchak, Phrakhanong, Bangkok 10250 Thailand

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG, BANGKOK 10250
TEL. 0-2717-3000-24 FAX. 0-2719-9484

ilac-MRA

ISO/IEC 17025:2017
CALIBRATION 0008

Certificate of Calibration

Certificate No. : 21E818
Page : 1 of 2

Equipment :	pH Meter
Manufacturer:	Thermo Orion
Model :	EA940
Serial No.:	6983
ID No.:	BKK_EN0102
Condition As-Received:	Used Item
Received Date:	05 March 2021
Calibration Date:	11 March 2021
Reference:	2103-0265D6C
Ambient Temperature:	(23 ± 2) °C
Relative Humidity:	(50 ± 10) %

This certificate may not be reproduced other than in full, except with the prior written approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.

Submitted by: ALS Laboratory Group (Thailand) Co.,Ltd.
104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand

Procedure used: Calibration were conducted using in-house calibration Procedure CP-E17 According to direct measurement method with Multi-Product Calibrator.

Condition of this result of calibration

1.Reference standards instruments :

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Multi-Product Calibrator	5500A	6440007	20E1574	07 May 2021

2.This result of calibration was made on requested at the point specified by customer.
3.The certificate is valid only to the item calibrated on date and place of calibration.
4.This Certification is traceable to the International System of Unit maintained at:-
-National Institute of Metrology Thailand (NIMT)

REVIEW BY Sriluk P.
APPROVED BY
NEXT CAL. DATE 9/9/22

Calibrated by : Pongsagorn Boonyaporn
Issue Date : 12 March 2021

Approved Signatory :
[ ] Phalinee Prabpaipal
[ ] Nuntawat Khamchai
[ ] Pornthippa Temyakul

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

Function: DC voltage measurement **Range:** Autorange
Channel : 1

Standard Value (mV)	UUC* Reading (mV)	Error (mV)	Uncertainty (± µV)
-200.0000	-200.1	-0.1	72
-100.0000	-100.1	-0.1	65
0.0000	-0.1	-0.1	58
100.0000	99.9	-0.1	65
200.0000	199.9	-0.1	72

Function: DC voltage measurement **Range:** Autorange
Channel : 2

Standard Value (mV)	UUC* Reading (mV)	Error (mV)	Uncertainty (± µV)
-200.0000	-200.2	-0.2	72
-100.0000	-100.2	-0.2	65
0.0000	-0.2	-0.2	58
100.0000	99.9	-0.1	65
200.0000	199.9	-0.1	72

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

UUC* = Unit Under Calibration.

-o0o-

REVIEW BY Avitcharawan S.
APPROVED BY Sarayut M. 12/Jan/22
NEXT CAL. DATE 12/Jan/23

ARCHEMICA

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: 5450A36659

For

ALS Laboratory Group (Thailand) Co., Ltd.

Operator Signature: _____ Date: Jan 12, 2022

(Mr.Thitipong Piromkripuk)

Applications Chemist

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

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

NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACC21010
Pages : 1 of 3

Calibration Certificate

Equipment :	SOUND CALIBRATOR
Manufacturer :	RION
Model :	NC-74
Serial No.:	34178124
ID No.:	RYG_FS0216
Condition As Found :	GOOD
Customer :	ALS LABORATORY GROUP (THAILAND) CO., LTD. 104 PHATTHANAKAN 40, PHATTHANAKAN ROAD, KHWAENG PHATTHANAKAN, KHET SUAN LUANG, BANGKOK, 10250 THAILAND.

REVIEW BY Nathakorn P.
APPROVED BY
NEXT CAL. DATE 9/8/22

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

Received Date : 05 AUGUST 2021
Calibration Date : 09 AUGUST 2021
Date of Issue : 11 AUGUST 2021

Calibrated by : Nathakorn Pisutpisan

Approved by : T. Petchurai
(Thanakul Petchurai)

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

SITHIPORN associates SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACC21010
Job No. : VC64AC0058
Pages : 2 of 3

Calibration Procedure : CP-AC-03

Calibration Method :

This equipment was calibrated by based on IEC-60942-2003 Standard.
The sound pressure level, frequency and total distortion of the sound calibrator was measured using the reference microphone.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL-BP. 05/0264	10-Feb-22
Digital Multimeter	8846A	1997025	EEL-BP. 06/0264	05-Feb-22
Digital Multimeter	33461A	MY53220116	EEL-BP. 04/0264	10-Feb-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KAI	34560495	AA-3003-21	16-Feb-22
Audio Analyzer	AVR-3360A	V744B6069	EF-0010-21	10-Feb-22

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :
   3.1 National Institute of Metrology (Thailand).
   3.2 Thailand Institute of Scientific and Technological Research (TISTR).

T. Petch...

SITHIPORN associates SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACC21010
Job No. : VC64AC0058
Pages : 3 of 3

Result of calibration :

1. Sound pressure level

Specified sound pressure level (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit (dB)
94	94.16	0.16	0.23	0.40

2. Frequency

Specified Frequency (Hz)	Measured value (Hz)	Deviated value (%)	Uncertainty (%)	Tolerance limit (%)
1000	1001.3	0.1	0.1	1.0

3. Total distortion

Measured value (%)	Uncertainty (%)	Tolerance limit (%)
1.88	0.10	3.0

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

End of Calibration Certificate

T. Pet...

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

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

NSC-TISI-TIS 17025
CALIBRATION 0384

Cert. No. : ACL22058
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42/ Microphone UC-52 / Preamplifier NH-24
Serial No.: 00296518 / 179118 / 87525
ID No.: RYG_FS0431

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

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

REVIEW BY Nathakorn P.
APPROVED BY
NEXT CAL DATE 21/1/23

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

Calibrated by : Nathakorn Pisutpaisan

Approved by :
(Thanakul Petchurai)

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

Calibration Procedure : CP-AC-01

Calibration Method :
This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :
1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	34461A	MY53220104	EEL.B3. 05/0264	10-Feb-22
Digital Multimeter	34461A	MY53220076	EEL.B3. 03/0264	08-Feb-22
Digital Multimeter	34461A	MY60024273	1-15183725251-1	15-Sep-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KAI	34560495	AA-3003-21	16-Feb-22

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :
3.1 National Institute of Metrology (Thailand).
3.2 Thailand Institute of Scientific and Technological Research (TISTR).

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings				
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings				
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For >4 kHz to 10 kHz	✓	-	0.3	0.7
For > 10 kHz to 20 kHz	-	-		1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long - term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓		0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Tone burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

Result of calibration :

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.6

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

Frequency Weighting	Measured value (dB)
A - weight	11.6
C - weight	17.6
Flat	23.2

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.1	0.1	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	0.8	0.9	0.9	±5.0

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	-0.1	±1.5
250	-0.1	0.0	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.0	0.0	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.1	0.1	± 1.1
135.0	135.1	0.1	± 1.1
134.0	134.1	0.1	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.1	0.1	± 1.1
114.0	114.1	0.1	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.1	0.1	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.1	0.1	± 1.1

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	116.9	-0.1	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

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

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

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.7	89.7	0.0	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance 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

ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT
975 Moo 4, Bangpoo Industrial Estate, Soi 8, Sukhumvit Road km 37,
Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280
Tel. +66 2709 4860-8 Fax +66 2324 0917-8
NSC-TISI-TIS 17025 CALIBRATION 0119

Certificate No.: 0147SV21
Operation No.: CP2021030034

Certificate of Calibration

Equipment:	Sound Calibrator
Manufacturer:	RION
Model/Type:	NC-74
Serial No.:	34178121
ID No.:	RYG_FS0213
Customer:	ALS Labolatory Group (Thailand) Co.,Ltd.
Address:	104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan Khet Suan Luang, Bangkok 10250 Thailand
Received Date:	19 March 2021
Calibrated Date:	24 March 2021
Issued Date:	25 March 2021
Calibrated by:	Ms. Juntaporn Kunhakcm

REVIEW BY Mankoonh P.
APPROVED BY
NEXT CAL. DATE 24/3/22

Approved by:
(Mr. Sittichai Swaksuriyawong)
Group Manager

The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor $k = 2.00$, providing a level of confidence of approximately 95%. This certificate may not be reproduced other than in full except with the prior written approval of the Electrical and Electronics Institute, Foundation for Industrial Development.

Certificate No.: 0147SV21

Calibration Report

Equipment:	Sound Calibrator
Manufacturer:	RION
Model/Type:	NC-74
Serial No.:	34178121
ID No.:	RYG_FS0213
Ambient Temperature:	(23 ± 2) °C
Relative Humidity:	(50 ± 15) %
Pressure:	(101.3 ± 1.5) kPa

Method of Calibration :-
IEC 60942:2017

Condition of this result of calibration
1. Reference standards instrument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2661000	AA-1013-20	12 May 2021
2) Waveform Generator	33511B	MY52302264	0100RF20	17 June 2021
3) Audio Analyzing DMM	2015-P	000136E	E1U203927	16 November 2021
4) Pressure, humidity and Temperature Transmitter	PTU301	F0640002	CL1-P200951 0305TE20	31 May 2021 29 June 2021

2. This result of calibration was found accurate as shown on date and place of calibration only.
3. This certification is traceable to the international system of unit maintained at :-
Reference standards instrument for Acoustic function
- National Institute of Metrology (Thailand)
Reference standards instrument for Electrical function
- Electrical and Electronics Institute; ONSC Accredited Calibration No.0119

Result of Calibration:-
1. Function : Sound pressure level

Norminal Frequency (Hz)	Specified Sound Pressure level (dB)	Measured value (dB)	Deviated value[1] (dB)	Acceptance limit[3] (dB)
1000	94	94.16	0.16	±0.25

2. Function : Frequency

Norminal Sound Pressure level (dB)	Specified Frequency (Hz)	Measured value (Hz)	Deviated value[2] (%)	Acceptance limit[3] (%)
94	1000	1003.1	0.3	±0.7

Certificate No.: 0147SV21

Calibration Report

3. Function : Total distortion + noise

Norminal Sound Pressure level (dB)	Norminal Frequency (Hz)	Measured value[4] (%)	Acceptance limit[5] (%)
94	1000	1.6	2.5

Uncertainty of measurement

Function	Uncertainty	Maximum-permitted uncertainty of measurement
Sound pressure level	0.10 dB	0.15 dB
Frequency	0.10 %	0.20 %
Total distortion + noise	0.40 %	0.50 %

Note: [1] The deviated value is the absolube valule of the difference between the measured value and the corresponding specified sound pressure level.
[2] The deviated value is the absolube valule of the difference in percent between the measured value and the corresponding specified frequency.
[3] The acceptance limit is for the deviated value.
[4] The measured value is the total distortion + noise, measured over the frequency range from 20 Hz to 20 kHz.
[5] The acceptance limit is for the Measured value.
Remarks: 1. Using the 1/2-inch microphone adaptor NC-74-002.
2. Acceptance limit was IEC 60942:2017 Class 1.

- - End of Report - -

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY
451-451/1 Sirinthorn Rd.,Bangplud Bangkok 10700 THAILAND.
Tel.0-2455-8800 Fax.0-2433-1679 e-mail:cal-center@sithiphorn.com http://www.sithiphorn.com
NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL21119
Pages : 1 of 8

Calibration Certificate

Equipment :	SOUND LEVEL METER
Manufacturer :	RION
Model :	NL-42/ Microphone UC-52 / Preamplifier NH-24
Serial No.:	01122579 / 172172 / 74022
ID No.:	RYG_FS0018
Condition As Found :	GOOD
Customer :	ALS LABORATORY GROUP (THAILAND) CO., LTD. 104 PHATTHANAKAN 40, PHATTHANAKAN ROAD, KHWAENG PHATTHANAKAN, KHET SUAN LUANG, BANGKOK, 10250 THAILAND.
Location :	-
Ambient Temperature :	(23.0 ± 3) °C
Pressure :	(101.3 ± 3) kPa
Relative Humidity :	(50.0 ± 20) %
Received Date :	21 SEPTEMBER 2021
Calibration Date :	04-06 OCTOBER 2021
Date of Issue :	11 OCTOBER 2021
Calibrated by :	Nathakorn Pisutpaisan

REVIEW BY Mankoonh P.
APPROVED BY
NEXT CAL. DATE 4/10/22

Approved by :
(Thanakul Petcharai)

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.

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

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

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :
   3.1 National Institute of Metrology (Thailand).
   3.2 Thailand Institute of Scientific and Technological Research (TISTR).

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.3	N/A
3. Acoustical signal tests of frequency weightings				
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings				
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For >4 kHz to 10 kHz	✓	-	0.3	0.7
For > 10 kHz to 20 kHz	-	-	-	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long - term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Tone burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

Result of calibration :

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.8

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

Frequency Weighting	Measured value (dB)
A - weight	11.6
C - weight	19.5
Flat	26.2

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.2	0.3	0.2	± 1.5
1000	0.0	-0.1	0.0	± 1.0
8000	-1.0	-0.9	-0.9	±5.0

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	-0.1	±1.5
250	0.0	0.0	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	132.9	-0.1	± 1.1
132.0	131.9	-0.1	± 1.1
131.0	130.9	-0.1	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.1	0.1	± 1.1

T. Petchurai

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lcpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	136.1	-0.3	±3.0

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

T. Petchurai

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.5	0.0	±1.5

12. High level stability

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

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

End of Calibration Certificate

T. Petchurai

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

451-451/1 Sirinthorn Rd.,Bangbumru, Bangplud Bangkok 10700 THAILAND
Tel.0-2435-8800 Fax0-2433-1679 e-mail:cal-center@sithiphorn.com http://www.sithiphorn.com

ISC-TISI-TIS 17025 CALIBRATION 0494

Cert. No. : ACL21116
Pages : 1 of 9

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-21/ Microphone UC-52 / Preamplifier NH-21
Serial No.: 00376364 / 71486 / 23142
ID No.: RYG_FS0012

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

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

REVIEW BY Nanakorn P.
APPROVED BY
NEXT CAL DATE 4/10/22

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

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petchurai
(Thanakul Petchurai)

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

Calibration Procedure : CP-AC-02

Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).

The SLM had tests for Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	34461A	MY53220104	EEL.BP. 05/0264	10-Feb-22
Digital Multimeter	34461A	MY53220076	EEL.BP. 03/0264	08-Feb-22
Digital Multimeter	8846A	1997025	EEL.BP. 06/0264	05-Feb-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KAI	34560495	AA-3003-21	16-Feb-22

2. This result of calibration was found accurate as shown ondate and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :
   3.1 National Institute of Metrology (Thailand).
   3.2 Thailand Institute of Scientific and Technological Research (TISTR).

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings				
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings				
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For > 4 kHz to 10 kHz	✓	-	0.3	0.7
For > 10 kHz to 20 kHz	-	-	-	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long - term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity inclucing the level range control	✓	-	0.2	0.3
9. Tone burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

Result of calibration :

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
23.8

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

Frequency Weighting	Measured value (dB)
A - weight	22.0
C - weight	22.7
Flat	25.6

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.4	0.4	0.4	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	0.1	0.2	0.2	±5.0

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	-0.2	0.0	0.0	±2.0
125	-0.2	0.0	0.0	±1.5
250	-0.1	0.0	-0.1	±1.5
500	-0.1	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.1	±2.0
4000	0.0	0.1	0.1	±3.0
8000	0.0	0.2	0.2	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	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

8. Level linearity including the level range control

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

Level linearity on each level range

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	43.0	43.0	0.0	±0.5
120	33.0	32.6	-0.4	±0.5

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	108.0	0.0	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lcpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.00	0.0	-
One	136.4	136	-0.4	±3.0

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

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.4	89.2	-0.2	±1.5

12. High level stability

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

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

End of Calibration Certificate

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

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NSC-TISI-TIS 17025 CALIBRATION 0894

Cert. No. : ACL21118
Pages : 1 of 8

Calibration Certificate

Equipment :	SOUND LEVEL METER
Manufacturer :	RION
Model :	NL-42/ Microphone UC-52 / Preamplifier NH-24
Serial No.:	01122578 / 143486 / 22620
ID No.:	RYG_FS0017
Condition As Found :	GOOD
Customer :	ALS LABORATORY GROUP (THAILAND) CO., LTD. 104 PHATTHANAKAN 40, PHATTHANAKAN ROAD, KHWAENG PHATTHANAKAN, KHET SUAN LUANG, BANGKOK, 10250 THAILAND.
Location :	-
Ambient Temperature :	(23.0 ± 3) °C
Pressure :	(101.3 ± 3) kPa
Relative Humidity :	(50.0 ± 20) %
Received Date :	21 SEPTEMBER 2021
Calibration Date :	04-06 OCTOBER 2021
Date of Issue :	11 OCTOBER 2021

REVIEW BY Nathakorn P.
APPROVED BY
NEXT CAL DATE 4/10/22

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petchurai
(Thanakul Petchurai)

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

Calibration Procedure : CP-AC-01

Calibration Method :
This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :
1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	34461A	MY53220104	EEL.B3. 05/0264	10-Feb-22
Digital Multimeter	34461A	MY53220076	EEL.B3. 03/0264	08-Feb-22
Digital Multimeter	8846A	1997025	EEL.B3. 06/0264	05-Feb-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KAI	34560495	AA-1003-21	16-Feb-22

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :
   3.1 National Institute of Metrology (Thailand).
   3.2 Thailand Institute of Scientific and Technological Research (TISTR).

T. Petch

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings				
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings				
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For > 4 kHz to 10 kHz	✓	-	0.3	0.7
For > 10 kHz to 20 kHz	-	-	-	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long - term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Tone burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

T. Petch

Result of calibration :

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
17.9

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

Frequency Weighting	Measured value (dB)
A - weight	15.5
C - weigh	20.9
Flat	26.3

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve: (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.1	0.1	± 1.5
1000	-0.1	-0.1	-0.1	± 1.0
8000	0.5	0.6	0.6	±5.0

T. Petch

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

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7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.1	0.1	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.1	0.1	± 1.1
69.0	69.1	0.1	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.1	0.1	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.1	0.1	± 1.1
30.0	30.2	0.2	± 1.1
29.0	29.2	0.2	± 1.1
28.0	28.2	0.2	± 1.1
27.0	27.3	0.3	± 1.1
26.0	26.4	0.4	± 1.1
25.0	25.5	0.5	± 1.1

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8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

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

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.1	0.1	-
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

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11. Overload indication

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

12. High level stability

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

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

End of Calibration Certificate

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ISO/IEC 17025 CALIBRATION 0384

Cert. No. : ACL21061
Pages : 1 of 9

Calibration Certificate

Equipment :	SOUND LEVEL METER
Manufacturer :	RION
Model :	NL-21/ Microphone UC-52 / Preamplifier NH-21
Serial No.:	00376363 / 172443/ 23141
ID No.:	RYG_FS0011
Condition As Found :	GOOD
Customer :	ALS LABORATORY GROUP (THAILAND) CO., LTD. 104 PHATTHANAKAN 40, PHATTHANAKAN ROAD, KHWAENG PHATTHANAKAN, KHET SUAN LUANG, BANGKOK, 10250 THAILAND.
Location :	-
Ambient Temperature :	(23.0 ± 3) °C
Pressure :	(101.3 ± 3) kPa
Relative Humidity :	(50.0 ± 20) %
Received Date :	22 JUNE 2021
Calibration Date :	28-30 JUNE 2021
Date of Issue :	05 JUNE 2021

REVIEW BY Nanakorn P.
APPROVED BY
NEXT CAL. DATE 28/6/22

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petchurai

(Thanakul Petchurai)

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

Calibration Procedure : CP-AC-02

Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL_BP. 05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL_BP. 03/0264	08-Feb-22
Digital Multimeter	33461A	MY53220116	EEL_BP. 04/0264	10-Feb-22
Programmable Attenuator	MAT-1070	62100114	1508-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KA	34560495	AA-3003-21	16-Feb-22

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :
   3.1 National Institute of Metrology (Thailand).
   3.2 Thailand Institute of Scientific and Technological Research (TISTR).

T. Petch

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings				
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings				
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For > 4 kHz to 10 kHz	✓	-	0.3	0.7
For > 10 kHz to 20 kHz	-	-	-	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long - term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Tone burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

T. Petch

Result of calibration :

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
22.4

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

Frequency Weighting	Measured value (dB)
A - weight	21.8
C - weight	22.5
Flat	25.0

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	1.0	1.1	1.0	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	-0.1	0.0	0.0	±5.0

T. Petch

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	-0.2	-0.1	-0.1	±2.0
125	-0.1	0.0	-0.1	±1.5
250	-0.1	-0.1	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.1	0.1	0.1	±2.0
4000	0.1	0.1	0.0	±3.0
8000	0.0	0.2	0.2	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

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7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	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	88.9	-0.1	± 1.1
84.0	83.9	-0.1	± 1.1
79.0	78.9	-0.1	± 1.1
74.0	73.9	-0.1	± 1.1
69.0	68.9	-0.1	± 1.1
64.0	63.9	-0.1	± 1.1
59.0	58.9	-0.1	± 1.1
54.0	53.9	-0.1	± 1.1
49.0	49.0	0.0	± 1.1
44.0	43.9	-0.1	± 1.1
39.0	38.7	-0.3	± 1.1

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8. Level linearity including the level range control

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

Level linearity on each level range

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	43.0	42.9	-0.1	±0.5
120	33.0	33.0	0.0	±0.5

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	116.9	-0.1	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.8	-0.2	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	127.9	-0.1	±1.0

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10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lcpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.00	0.0	-
One	136.4	136.1	-0.3	±3.0

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

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.2	-0.3	±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

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

451-451/1 Sirinthorn Rd.,Bangbumru, Bangplud Bangkok 10700 THAILAND
Tel.0-2435-8600 Fax.0-2433-1679 e-mail:cal-center@sithiphorn.com http://www.sithiphorn.com

NSC-TISI-TIS 17025
CALIBRATION 0384

Cert. No. : ACL22022
Pages : 1 of 9

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-21/ Microphone UC-52 / Preamplifier NH-21
Serial No.: 00465461 / 108081 / 19513
ID No.: RYG_FS0007

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

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

REVIEW BY Narakorn P.
APPROVED BY
NEXT CAL. DATE 10/1/23

Received Date : 03 JANUARY 2022
Calibration Date : 10-12 JANUARY 2022
Date of Issue : 13 JANUARY 2022

Calibrated by : Nathakorn Pisutpaisan

Approved by : (Thanakul Petchtrai)

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.

Calibration Procedure : CP-AC-02

Calibration Method :
This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :
1. Reference Standard Insruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL.BF. 05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL.BF. 03/0264	08-Feb-22
Digital Multimeter	8846A	1097025	EEL.BF. 06/0264	05-Feb-22
Programmable Attenuator	MAT-1070	67100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KM	34560495	AA-1003-21	16-Feb-22

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :
   3.1 National Institute of Metrology (Thailand).
   3.2 Thailand Institute of Scientific and Technological Research (TISTR).

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings				
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings				
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For > 4 kHz to 10 kHz	✓	-	0.3	0.7
For > 10 kHz to 20 kHz	-	-	-	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long - term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Tone burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

Cert. No. : ACL22022
Job No. : VC65AC0040
Pages : 4 of 9

Result of calibration :

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
24.6

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

Frequency Weighting	Measured value (dB)
A - weight	23.5
C - weight	25.6
Flat	33.6

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.0	0.1	0.0	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	0.6	0.8	0.7	±5.0

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CALIBRATION LABORATORY
Continuation of Calibration Certificate

Cert. No. : ACL22022
Job No. : VC65AC0040
Pages : 5 of 9

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

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Continuation of Calibration Certificate

Cert. No. : ACL22022
Job No. : VC65AC0040
Pages : 6 of 9

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	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

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Continuation of Calibration Certificate

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Job No. : VC65AC0040
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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)
130	94.0	94.0	0.0	±0.5
120	94.0	94.0	0.0	±0.5
110	94.0	94.0	0.0	±0.5
100	94.0	94.0	0.0	±0.5
90	94.0	94.0	0.0	±0.5

Level linearity on each level range

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	43.0	43.0	0.0	±0.5
120	33.0	32.6	-0.4	±0.5

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value Lcpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	135.9	-0.5	±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	-
Positive half cycle	135.4	135.0	-0.4	±2.0
Negative half cycle	135.4	135.0	-0.4	±2.0

11. Overload indication

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

ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT
975 Moo 4, Bangpoo Industrial Estate, Soi 8, Sukhumvit Road km 37,
Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280
Tel. +66 2709 4860-8 Fax +66 2328 0917-8

NSC-TISI-TIS 17025 CALIBRATION 0119

Certificate No.: 01675V21
Operation No.: CP2021040003

Certificate of Calibration

Equipment:	Sound Level Meter
Manufacturer:	RION
Model/Type:	NL-21 (Meter), UC-52 (Microphone), NH-21 (Preamplifier)
Serial No.:	00509355 (Meter), 143845 (Microphone), 32731 (Preamplifier)
ID No.:	RYG_FS0015
Customer:	ALS Labolatory Group (Thailand) Co.,Ltd.
Address:	104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan Khet Suan Luang, Bangkok 10250 Thailand
Received Date:	7 April 2021
Calibrated Date:	21 - 27 April 2021
Issued Date:	28 April 2021
Calibrated by:	Ms. Juntaporn Kunhakorn

REVIEW BY Mana Kanan P.
APPROVED BY
NEXT CAL. DATE 21/4/22

Approved by: (Mr. Sittichai Swaksuriyawong)
Group Manager

The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor $k = 2.00$, providing a level of confidence of approximately 95%. This certificate may not be reproduced other than in full except with the prior written approval of the Electrical and Electonics Institute, Foundation for Industrial Development.

ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

Certificate No.: 0167SV21

Calibration Report

Equipment: Sound Level Meter
Manufacturer: RION
Model/Type: NL-21 (Meter), UC-52 (Microphone), NH-21 (Preamplifier)
Serial No.: 00509355 (Meter), 143845 (Microphone), 32731 (Preamplifier)
ID No.: RYG_FS0015
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 15) %
Pressure: (101.3 ± 1.5) kPa
Method of Calibration :-
IEC 61672-3:2013

Condition of this result of calibration

1. Reference standards instument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2651000	AA-1013-20	12 May 2021
2) Sine generator	1051	1501442	0151RF20	21 September 2021
3) Arbitrary Function Generator	AFG2021	C010063	0099RF20	17 June 2021
4) Programmable Attenuator	PA5	1755	EF-0034-20	10 November 2021
5) 6.5 Digit precision multimeter	8846A	9609027	0498EL20	10 August 2021
6) 6.5 Digit precision multimeter	8846A	9610014	0669EL20	27 October 2021
7) Pressure humidity and Temperature Transmitter	PTU301	F0640002	CL1-P200051 0305TE20	31 May 2021 28 June 2021
8) Pressure humidity and Temperature Transmitter	PTU301	F0640003	CL1-P200052 0306TE20	1 June 2021 28 June 2021

2. This result of calibration was found accurate as shown on date and place of calibration only
3. This certification is traceable to the international system of unit maintained at :-
   Reference standards instrument for Acoustic function
   - National Institute of Metrology (Thailand)
   Reference standards instrument for Electrical function
   - National Institute of Metrology (Thailand)
   - Electrical and Electronics Institute: ONSC Accredited Calibration No.0119

Result of Calibration:-
Function : 1. Indication at the calibration check frequency

Reference Acoustic Signal (dB)	Measured value (dB)	Deviation (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±1.0

Note : Absolute sensitivity was established by the use of the Sound Calibrator RION Type NC-74 S/N : 34615278.

Certificate No.: 0167SV21

Calibration Report

Function : 2. Self-generated Noise

2.1 Microphone installed

Measured value (dB)
16.4

2.2 Microphone replaced by the electrical input signal device

Frequency Weighting	Measured value (dB)
A-weighting	12.6
C-weighting	17.6
Z-weighting	23.2

Function : 3. Acoustical signal tests of frequency weightings (Without Windscreen)

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

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
125	0.6	0.8	0.6	±1.5
1000	-0.1	-0.1	0.0	±1.0
8000	-0.8	-0.8	-0.9	+5.0

Function : 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
63	-0.1	0.0	-0.2	±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	0.1	0.1	0.1	±2.0
4000	0.1	0.1	0.1	±3.0
8000	0.2	0.3	0.0	±5.0

Function : 5. Frequency and time weighting at 1 kHz

5.1 Frequency weighting at 1 kHz

Frequency Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
C-weighting	94.0	0.0	±0.2
A-weighting	94.0	0.0	±0.2
Z-weighting	94.0	0.0	±0.2

Certificate No.: 0167SV21

Calibration Report

5.2 Time weighting at 1 kHz

Time Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	94.0	0.0	±0.1
Slow	94.0	0.0	±0.1
LAeq	94.0	0.0	±0.1

Function : 6. Long-Term Stability

Long-term stability over 30 minutes, with steady 1 kHz signal at reference level.

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
30	94.0	94.0	0.0	±0.3

Function : 7. Level Linearity on the reference level range

7.1 Level Linearity on the reference level range, Upper

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±1.1
99.0	99.0	0.0	±1.1
104.0	104.0	0.0	±1.1
109.0	109.0	0.0	±1.1
114.0	114.0	0.0	±1.1
119.0	119.0	0.0	±1.1
120.0	120.0	0.0	±1.1
121.0	121.0	0.0	±1.1
122.0	122.0	0.0	±1.1
123.0	123.0	0.0	±1.1
124.0	124.0	0.0	±1.1
125.0	125.0	0.0	±1.1

7.2 Level Linearity on the reference level range, Lower

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.1	0.1	±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

Certificate No.: 0167SV21

Calibration Report

7.2 Level Linearity on the reference level range, Lower (Cont.)

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
39.0	38.9	-0.1	±1.1
34.0	33.9	-0.1	±1.1
33.0	32.9	-0.1	±1.1
32.0	31.8	-0.2	±1.1
31.0	30.9	-0.1	±1.1
30.0	29.8	-0.2	±1.1
29.0	28.8	-0.2	±1.1
28.0	27.7	-0.3	±1.1

Function : 8. Level Linearity including level range control

8.1. Level Linearity including the Level Range (Reference Signal)

Range	Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
20-100	94.0	94.1	0.1	±1.1
20-110	94.0	94.0	0.0	±1.1
30-120	94.0	94.0	0.0	±1.1
40-130	94.0	94.0	0.0	±1.1

8.2. Level Linearity including the Level range (5dB Above Under-range)

Range	Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
20-80	25.0	25.3	0.3	±1.1
20-90	25.0	25.3	0.3	±1.1
20-100	25.0	25.3	0.3	±1.1
20-110	25.0	25.2	0.2	±1.1
30-120	35.0	35.0	0.0	±1.1
40-130	45.0	45.0	0.0	±1.1

Function : 9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	200	116.0	0.0	±1.0
	2	99.0	0.0	+1.0 ; -2.5
	0.25	89.9	-0.1	+1.5 ; -5.0
Slow	200	109.6	0.0	±1.0
	2	90.0	0.0	+1.0 ; -5.0
LAE	200	110.0	0.0	±1.0
	2	90.0	0.0	+1.0 ; -2.5
	0.25	80.9	-0.1	+1.5 ; -5.0

Certificate No.: 0167SV21

Calibration Report

Function : 10. Peak C sound level

Number of cycles in test signal	Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Complete cycle	125.4	124.9	-0.5	±3.0
Positive half cycle	124.4	124.1	-0.3	±2.0
Negative half cycle	124.4	124.1	-0.3	±2.0

Function : 11. Overload indication

Measured value (dB)		Deviated value (dB)	Acceptance limits (dB)
Positive one-half cycle	Negative one-half cycle		
139.6	139.3	-0.1	±1.5

Function : 12. High-Level Stability

High-level stability over 5 minutes, with steady 1 kHz signal, 1 dB below upper boundary.

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
5	129.0	129.0	0.0	±0.3

Uncertainty of measurement

Function	Uncertainty (dB)	Maximum permitted uncertainty of measurement (dB)
1) Indication at the calibration check frequency	0.30	Not applicable
2) Self-generated Noise	0.10	Not applicable
3) Acoustical signal tests of frequency weightings - Free-field sound pressure response level	0.30	0.60 (10Hz to 4kHz) 0.70 (>4kHz to 10kHz)
4) Electrical signal tests of frequency weightings	0.20	0.20
5) Frequency and time weighting at 1 kHz	0.20	0.20
6) Long-Term Stability	0.10	0.10
7) Level Linearity on the reference level range	0.30	0.30
8) Level Linearity including level range control	0.30	0.30
9) Tone burst response	0.20	0.30
10) Peak C sound level	0.20	0.35
11) Overload indication	0.20	0.25
12) High-Level Stability	0.10	0.10

Remarks: 1. The acceptance limit is for the deviated value.
2. Acceptance limits was IEC61672-3:2013 Class 2.

- - End of Report - -