

# ภาคผนวก ค

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ใบรับรองผลการวิเคราะห์

# ภาคผนวก ค-1

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คุณภาพอากาศจากแหล่งกำเนิด



## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**



TESTING  
Nn 0042

**Lot ID: 2521661**  
Date Received : Mar 11, 2025  
Date Reported : Mar 18, 2025  
Report Number: 3251666-1

Page 1 of 1

**Sample Number** 2521661-1  
**Sampled Date** Mar 11, 2025  
**Sample Description** Emission from Stationary Source  
**Location** Baghouse Stack No.1/1 (S1)  
**Date Analysis Commenced** Mar 11, 2025  
**Condition of Sample** Extracted into one filter paper placed in plastic petri dish and one plastic bottle

### Stack Description

Ambient Pressure	753	mmHg	Diameter	1.17	m	Oxygen	20.9	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	0.0	%
Type of Process	Process		Stack Temperature	48.0	°C	Gas Velocity	16.7	m/s
Type of Fuel	-		Moisture	2.89	%	Flow Rate (Actual O2)	57919	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
<b>Air Testing</b>									
Total Suspended Particulate	02:00 PM - 02:48 PM	mg/m3	-	0.5	<0.5	120	16	United States Environmental Protection Agency, EPA Method 5	Rayong

**Guideline :** (1) Notification of the Ministry of Science Technology and Environment dated March 9, B.E. 2544 (2001), published in the Royal Government Gazette, Vol. 118 Special Part 37 dated May 8, B.E.2544 (2001)  
(2) Environmental Impact Assessment Report of Kiriu (Thailand) Co., Ltd.

**Sampling By :** Sittipan Sanachiw ทะเบียนเลขที่ ร-323-จ-0009

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

*Thanita K.*

Thanita Kulsuriwong  
Scientist (4)  
ทะเบียนเลขที่ ร-323-จ-0029

Approved by

*Dej Changchon*

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Senior Manager  
ทะเบียนเลขที่ ร-323-จ-0001

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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**



TESTING  
Nn 0042

**Lot ID: 2521662**  
Date Received : Mar 11, 2025  
Date Reported : Mar 18, 2025  
Report Number: 3251668-1

Page 1 of 1

**Sample Number** 2521662-1  
**Sampled Date** Mar 11, 2025  
**Sample Description** Emission from Stationary Source  
**Location** Baghouse Stack No.1/2 (S2)  
**Date Analysis Commenced** Mar 11, 2025  
**Condition of Sample** Extracted into one filter paper placed in plastic petri dish and one plastic bottle

### Stack Description

Ambient Pressure	753	mmHg	Diameter	1.17	m	Oxygen	20.9	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	0.0	%
Type of Process	Process		Stack Temperature	49.0	°C	Gas Velocity	14.2	m/s
Type of Fuel	-		Moisture	2.75	%	Flow Rate (Actual O2)	49155	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
<b>Air Testing</b>									
Total Suspended Particulate	01:00 PM - 01:42 PM	mg/m3	-	0.5	1.3	120	16	United States Environmental Protection Agency, EPA Method 5	Rayong

**Guideline :** (1) Notification of the Ministry of Science Technology and Environment dated March 9, B.E. 2544 (2001), published in the Royal Government Gazette, Vol. 118 Special Part 37 dated May 8, B.E.2544 (2001)  
(2) Environmental Impact Assessment Report of Kiriu (Thailand) Co., Ltd.

**Sampling By :** Sittipan Sanachiw ทะเบียนเลขที่ ร-323-จ-0009

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Technical Management

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Approved by

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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**



TESTING  
Nn 0042

**Lot ID: 2521663**  
Date Received : Mar 11, 2025  
Date Reported : Mar 18, 2025  
Report Number: 3251669-1

Page 1 of 1

**Sample Number** 2521663-1  
**Sampled Date** Mar 11, 2025  
**Sample Description** Emission from Stationary Source  
**Location** Baghouse Stack No.1/3 (S3)  
**Date Analysis Commenced** Mar 11, 2025  
**Condition of Sample** Extracted into one filter paper placed in plastic petri dish and one plastic bottle

### Stack Description

Ambient Pressure	753	mmHg	Diameter	0.89	m	Oxygen	20.9	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	0.0	%
Type of Process	Process		Stack Temperature	41.0	°C	Gas Velocity	10.9	m/s
Type of Fuel	-		Moisture	2.82	%	Flow Rate (Actual O2)	22334	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
<b>Air Testing</b>									
Total Suspended Particulate	11:30 AM - 12:24 PM	mg/m3	-	0.5	1.1	120	16	United States Environmental Protection Agency, EPA Method 5	Rayong

**Guideline :** (1) Notification of the Ministry of Science Technology and Environment dated March 9, B.E. 2544 (2001), published in the Royal Government Gazette, Vol. 118 Special Part 37 dated May 8, B.E.2544 (2001)  
(2) Environmental Impact Assessment Report of Kiriu (Thailand) Co., Ltd.

**Sampling By :** Sittipan Sanachiw ทะเบียนเลขที่ ร-323-จ-0009

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Technical Management

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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**



TESTING  
Nn 0042

**Lot ID: 2521664**  
Date Received : Mar 11, 2025  
Date Reported : Mar 18, 2025  
Report Number: 3251670-1

Page 1 of 1

**Sample Number** 2521664-1  
**Sampled Date** Mar 11, 2025  
**Sample Description** Emission from Stationary Source  
**Location** Baghouse Stack No.1/4 (S4)  
**Date Analysis Commenced** Mar 11, 2025  
**Condition of Sample** Extracted into one filter paper placed in plastic petri dish and one plastic bottle

### Stack Description

Ambient Pressure	753	mmHg	Diameter	0.68	m	Oxygen	20.9	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	0.0	%
Type of Process	Process		Stack Temperature	42.0	°C	Gas Velocity	11.9	m/s
Type of Fuel	-		Moisture	2.87	%	Flow Rate (Actual O2)	14202	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
<b>Air Testing</b>									
Total Suspended Particulate	10:30 AM - 11:18 AM	mg/m3	-	0.5	<0.5	120	16	United States Environmental Protection Agency, EPA Method 5	Rayong

**Guideline :** (1) Notification of the Ministry of Science Technology and Environment dated March 9, B.E. 2544 (2001), published in the Royal Government Gazette, Vol. 118 Special Part 37 dated May 8, B.E.2544 (2001)  
(2) Environmental Impact Assessment Report of Kiriu (Thailand) Co., Ltd.

**Sampling By :** Sittipan Sanachiw ทะเบียนเลขที่ ร-323-จ-0009

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Technical Management

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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**



TESTING  
Nn 0042

**Lot ID: 2521665**  
Date Received : Mar 11, 2025  
Date Reported : Mar 18, 2025  
Report Number: 3251671-1

Page 1 of 1

**Sample Number** 2521665-1  
**Sampled Date** Mar 11, 2025  
**Sample Description** Emission from Stationary Source  
**Location** Baghouse Stack No.1/5 (S5)  
**Date Analysis Commenced** Mar 11, 2025  
**Condition of Sample** Extracted into one filter paper placed in plastic petri dish and one plastic bottle

### Stack Description

Ambient Pressure	753	mmHg	Diameter	0.89	m	Oxygen	20.9	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	0.0	%
Type of Process	Process		Stack Temperature	39.0	°C	Gas Velocity	9.4	m/s
Type of Fuel	-		Moisture	2.74	%	Flow Rate (Actual O2)	19341	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
<b>Air Testing</b>									
Total Suspended Particulate	09:30 AM - 10:18 AM	mg/m3	-	0.5	<0.5	120	16	United States Environmental Protection Agency, EPA Method 5	Rayong

**Guideline :** (1) Notification of the Ministry of Science Technology and Environment dated March 9, B.E. 2544 (2001), published in the Royal Government Gazette, Vol. 118 Special Part 37 dated May 8, B.E.2544 (2001)  
(2) Environmental Impact Assessment Report of Kiriu (Thailand) Co., Ltd.

**Sampling By :** Sittipan Sanachiw ทะเบียนเลขที่ ร-323-จ-0009

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Technical Management

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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**



TESTING  
Nn 0042

**Lot ID: 2521666**  
Date Received : Mar 13, 2025  
Date Reported : Mar 19, 2025  
Report Number: 3251673-1

Page 1 of 1

**Sample Number** 2521666-1  
**Sampled Date** Mar 11, 2025  
**Sample Description** Emission from Stationary Source  
**Location** Baghouse Stack No.1/6 (S6)  
**Date Analysis Commenced** Mar 14, 2025  
**Condition of Sample** Extracted into one filter paper placed in plastic petri dish and one plastic bottle

### Stack Description

Ambient Pressure	753	mmHg	Diameter	1.30	m	Oxygen	20.9	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	0.0	%
Type of Process	Process		Stack Temperature	56.0	°C	Gas Velocity	15.5	m/s
Type of Fuel	-		Moisture	3.04	%	Flow Rate (Actual O2)	64857	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
<b>Air Testing</b>									
Total Suspended Particulate	02:40 PM - 03:34 PM	mg/m3	-	0.5	<0.5	120	8	United States Environmental Protection Agency, EPA Method 5	Rayong

**Guideline :** (1) Notification of the Ministry of Science Technology and Environment dated March 9, B.E. 2544 (2001), published in the Royal Government Gazette, Vol. 118 Special Part 37 dated May 8, B.E.2544 (2001)  
(2) Environmental Impact Assessment Report of Kiriu (Thailand) Co., Ltd.

**Sampling By :** Sutdamrong Chokpitinan ทะเบียนเลขที่ ร-323-จ-0037

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Technical Management

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Approved by

*Dej Changchon*

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Senior Manager  
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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**



TESTING  
Nn 0042

**Lot ID: 2521667**  
Date Received : Mar 13, 2025  
Date Reported : Mar 19, 2025  
Report Number: 3251674-1

Page 1 of 1

**Sample Number** 2521667-1  
**Sampled Date** Mar 11, 2025  
**Sample Description** Emission from Stationary Source  
**Location** Baghouse Stack No.1/7 (S7)  
**Date Analysis Commenced** Mar 14, 2025  
**Condition of Sample** Extracted into one filter paper placed in plastic petri dish and one plastic bottle

### Stack Description

Ambient Pressure	753	mmHg	Diameter	1.20	m	Oxygen	20.9	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	0.0	%
Type of Process	Process		Stack Temperature	41.0	°C	Gas Velocity	16.0	m/s
Type of Fuel	-		Moisture	3.15	%	Flow Rate (Actual O2)	59393	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
<b>Air Testing</b>									
Total Suspended Particulate	01:30 PM - 02:18 PM	mg/m3	-	0.5	<0.5	120	8	United States Environmental Protection Agency, EPA Method 5	Rayong

**Guideline :** (1) Notification of the Ministry of Science Technology and Environment dated March 9, B.E. 2544 (2001), published in the Royal Government Gazette, Vol. 118 Special Part 37 dated May 8, B.E.2544 (2001)  
(2) Environmental Impact Assessment Report of Kiriu (Thailand) Co., Ltd.

**Sampling By :** Sutdamrong Chokpitinan ทะเบียนเลขที่ ร-323-จ-0037

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Technical Management

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Approved by

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Senior Manager  
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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**



TESTING  
Nn 0042

**Lot ID: 2521668**  
Date Received : Mar 12, 2025  
Date Reported : Mar 18, 2025  
Report Number: 3251675-1

Page 1 of 1

**Sample Number** 2521668-1  
**Sampled Date** Mar 12, 2025  
**Sample Description** Emission from Stationary Source  
**Location** Baghouse Stack No.2/1 (S8)  
**Date Analysis Commenced** Mar 13, 2025  
**Condition of Sample** Contained in one filter paper placed in plastic petri dish and one plastic bottle

### Stack Description

Ambient Pressure	753	mmHg	Diameter	1.17	m	Oxygen	20.9	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	0.0	%
Type of Process	Process		Stack Temperature	50.0	°C	Gas Velocity	13.5	m/s
Type of Fuel	-		Moisture	2.99	%	Flow Rate (Actual O2)	46382	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
<b>Air Testing</b>									
Total Suspended Particulate	01:20 PM - 02:02 PM	mg/m3	-	0.5	0.9	120	16	United States Environmental Protection Agency, EPA Method 5	Rayong

**Guideline :** (1) Notification of the Ministry of Science Technology and Environment dated March 9, B.E. 2544 (2001), published in the Royal Government Gazette, Vol. 118 Special Part 37 dated May 8, B.E.2544 (2001)  
(2) Environmental Impact Assessment Report of Kiriu (Thailand) Co., Ltd.

**Sampling By :** Suphanut Pilsaipan ทะเบียนเลขที่ ร-323-จ-0018

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Technical Management

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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**



TESTING  
Nn 0042

**Lot ID: 2521669**  
Date Received : Mar 12, 2025  
Date Reported : Mar 18, 2025  
Report Number: 3251676-1

Page 1 of 1

**Sample Number** 2521669-1  
**Sampled Date** Mar 12, 2025  
**Sample Description** Emission from Stationary Source  
**Location** Baghouse Stack No.2/2 (S9)  
**Date Analysis Commenced** Mar 13, 2025  
**Condition of Sample** Extracted into one filter paper placed in plastic petri dish and one plastic bottle

### Stack Description

Ambient Pressure	753	mmHg	Diameter	1.17	m	Oxygen	20.9	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	0.0	%
Type of Process	Process		Stack Temperature	58.0	°C	Gas Velocity	17.9	m/s
Type of Fuel	-		Moisture	2.87	%	Flow Rate (Actual O2)	60434	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
<b>Air Testing</b>									
Total Suspended Particulate	09:30 AM - 10:18 AM	mg/m3	-	0.5	1.4	120	16	United States Environmental Protection Agency, EPA Method 5	Rayong

**Guideline :** (1) Notification of the Ministry of Science Technology and Environment dated March 9, B.E. 2544 (2001), published in the Royal Government Gazette, Vol. 118 Special Part 37 dated May 8, B.E.2544 (2001)  
(2) Environmental Impact Assessment Report of Kiriu (Thailand) Co., Ltd.

**Sampling By :** Suphanut Pisaipan ทะเบียนเลขที่ ร-323-จ-0018

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- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

*Thanita K.*

Thanita Kulsuriwong  
Scientist (4)  
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Approved by

*D. Changchon*

Dej Changchon  
Senior Manager  
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S:\Reports\\_Air Stack\\_2GL.rpt ( 5:19PM)



## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**



TESTING  
Nn 0042

**Lot ID: 2521670**  
Date Received : Mar 12, 2025  
Date Reported : Mar 19, 2025  
Report Number: 3251679-1

Page 1 of 1

**Sample Number** 2521670-1  
**Sampled Date** Mar 12, 2025  
**Sample Description** Emission from Stationary Source  
**Location** Baghouse Stack No.2/3 (S10)  
**Date Analysis Commenced** Mar 13, 2025  
**Condition of Sample** Extracted into one filter paper placed in plastic petri dish and one plastic bottle

### Stack Description

Ambient Pressure	753	mmHg	Diameter	0.89	m	Oxygen	20.9	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	0.0	%
Type of Process	Process		Stack Temperature	48.0	°C	Gas Velocity	14.6	m/s
Type of Fuel	-		Moisture	2.75	%	Flow Rate (Actual O2)	29193	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
<b>Air Testing</b>									
Total Suspended Particulate	12:30 PM - 01:12 PM	mg/m3	-	0.5	1.8	120	16	United States Environmental Protection Agency, EPA Method 5	Rayong

**Guideline :** (1) Notification of the Ministry of Science Technology and Environment dated March 9, B.E. 2544 (2001), published in the Royal Government Gazette, Vol. 118 Special Part 37 dated May 8, B.E.2544 (2001)  
(2) Environmental Impact Assessment Report of Kiriu (Thailand) Co., Ltd.

**Sampling By :** Suphanut Pisaipan ทะเบียนเลขที่ ร-323-จ-0018

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- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

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Approved by

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Dej Changchon  
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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**



TESTING  
Nn 0042

**Lot ID: 2521671**  
Date Received : Mar 12, 2025  
Date Reported : Mar 19, 2025  
Report Number: 3251680-1

Page 1 of 1

**Sample Number** 2521671-1  
**Sampled Date** Mar 12, 2025  
**Sample Description** Emission from Stationary Source  
**Location** Baghouse Stack No.2/4 (S11)  
**Date Analysis Commenced** Mar 13, 2025  
**Condition of Sample** Extracted into one filter paper placed in plastic petri dish and one plastic bottle

### Stack Description

Ambient Pressure	753	mmHg	Diameter	0.68	m	Oxygen	20.9	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	0.0	%
Type of Process	Process		Stack Temperature	50.0	°C	Gas Velocity	12.7	m/s
Type of Fuel	-		Moisture	2.87	%	Flow Rate (Actual O2)	14755	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
<b>Air Testing</b>									
Total Suspended Particulate	11:30 AM - 12:18 PM	mg/m3	-	0.5	0.6	120	16	United States Environmental Protection Agency, EPA Method 5	Rayong

**Guideline :** (1) Notification of the Ministry of Science Technology and Environment dated March 9, B.E. 2544 (2001), published in the Royal Government Gazette, Vol. 118 Special Part 37 dated May 8, B.E.2544 (2001)  
(2) Environmental Impact Assessment Report of Kiriu (Thailand) Co., Ltd.

**Sampling By :** Suphanut Pisaipan ทะเบียนเลขที่ ร-323-จ-0018

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Technical Management

*Thanita K.*  
Thanita Kulsuriwong  
Scientist (4)  
ทะเบียนเลขที่ ร-323-จ-0029

Approved by

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Dej Changchon  
Senior Manager  
ทะเบียนเลขที่ ร-323-จ-0001

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## Analysis / Test Report

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300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**



TESTING  
Nn 0042

**Lot ID: 2521672**  
Date Received : Mar 12, 2025  
Date Reported : Mar 19, 2025  
Report Number: 3251681-1

Page 1 of 1

**Sample Number** 2521672-1  
**Sampled Date** Mar 12, 2025  
**Sample Description** Emission from Stationary Source  
**Location** Baghouse Stack No.2/5 (S12)  
**Date Analysis Commenced** Mar 13, 2025  
**Condition of Sample** Extracted into one filter paper placed in plastic petri dish and one plastic bottle

### Stack Description

Ambient Pressure	753	mmHg	Diameter	0.89	m	Oxygen	20.9	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	0.0	%
Type of Process	Process		Stack Temperature	50.0	°C	Gas Velocity	16.2	m/s
Type of Fuel	-		Moisture	2.88	%	Flow Rate (Actual O2)	32290	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
<b>Air Testing</b>									
Total Suspended Particulate	10:30 AM - 11:18 AM	mg/m3	-	0.5	1.0	120	16	United States Environmental Protection Agency, EPA Method 5	Rayong

**Guideline :** (1) Notification of the Ministry of Science Technology and Environment dated March 9, B.E. 2544 (2001), published in the Royal Government Gazette, Vol. 118 Special Part 37 dated May 8, B.E.2544 (2001)  
(2) Environmental Impact Assessment Report of Kiriu (Thailand) Co., Ltd.

**Sampling By :** Suphanut Pisaipan ทะเบียนเลขที่ ร-323-จ-0018

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- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

*Thanita K.*  
Thanita Kulsuriwong  
Scientist (4)  
ทะเบียนเลขที่ ร-323-จ-0029

Approved by

*D. Changchon*  
Dej Changchon  
Senior Manager  
ทะเบียนเลขที่ ร-323-จ-0001

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## Analysis / Test Report

TESTING  
No 0042

**Client :** Kiriu (Thailand) Co., Ltd.  
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**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**

**Lot ID: 2521673**  
Date Received : Mar 13, 2025  
Date Reported : Mar 19, 2025  
Report Number: 3251683-1

Page 1 of 1

**Sample Number** 2521673-1  
**Sampled Date** Mar 11, 2025  
**Sample Description** Emission from Stationary Source  
**Location** Baghouse Stack No.2/6 (S13)  
**Date Analysis Commenced** Mar 14, 2025  
**Condition of Sample** Extracted into one filter paper placed in plastic petri dish and one plastic bottle

### Stack Description

Ambient Pressure	753	mmHg	Diameter	1.20	m	Oxygen	20.9	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	0.0	%
Type of Process	Process		Stack Temperature	40.0	°C	Gas Velocity	15.1	m/s
Type of Fuel	-		Moisture	3.15	%	Flow Rate (Actual O2)	56122	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
<b>Air Testing</b>									
Total Suspended Particulate	10:00 AM - 10:54 AM	mg/m3	-	0.5	<0.5	120	15	United States Environmental Protection Agency, EPA Method 5	Rayong

**Guideline :** (1) Notification of the Ministry of Science Technology and Environment dated March 9, B.E. 2544 (2001), published in the Royal Government Gazette, Vol. 118 Special Part 37 dated May 8, B.E.2544 (2001)  
(2) Environmental Impact Assessment Report of Kiriu (Thailand) Co., Ltd.

**Sampling By :** Sutdamrong Chokpitinan ทะเบียนเลขที่ ว-323-จ-0037

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- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

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Thanita Kulsuriwong  
Scientist (4)  
ทะเบียนเลขที่ ว-323-จ-0029

Approved by

*D. Changchon*

Dej Changchon  
Senior Manager  
ทะเบียนเลขที่ ว-323-จ-0001

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# ภาคผนวก ค-2

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คุณภาพอากาศในบรรยากาศ



## Analysis / Test Report

TESTING  
No.0042

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**

**Lot ID: 2521680**

Date Received : Mar 18, 2025  
Date Reported : Mar 22, 2025  
Report Number: 3251656-1

Page 1 of 1

<b>Sample Description</b>	Air Quality			
<b>Location</b>	วัดจอมพลเจ้าพระยา (A1)			
<b>Date Analysis Commenced</b>	Mar 19, 2025			
<b>Condition of Sample</b>	Drawn into one glass filter paper (8x10 inch) placed in plastic bag			
Sample Number	Sampled Date	Total Suspended Particulate (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2521680-1	Mar 08 - Mar 09, 2025	0.055	759*	31.2*
2521680-2	Mar 09 - Mar 10, 2025	0.075	759*	31.4*
2521680-3	Mar 10 - Mar 11, 2025	0.084	759*	32.6*
2521680-4	Mar 11 - Mar 12, 2025	0.047	759*	31.4*
2521680-5	Mar 12 - Mar 13, 2025	0.043	759*	32.2*
2521680-6	Mar 13 - Mar 14, 2025	0.035	759*	31.6*
2521680-7	Mar 14 - Mar 15, 2025	0.035	759*	32.6*
<b>Guideline</b>		0.33	-	-

### Reference Method

Total Suspended Particulate : United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008

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

**Sampled By :** Santi Chaichana

**Remark :** Result (s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.

-

Approved by

*Thanita K.*

Thanita Kulsuriwong  
Scientist (4)

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TESTING  
No.0042

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**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**

**Lot ID: 2521680**

Date Received : Mar 18, 2025  
Date Reported : Mar 22, 2025  
Report Number: 3251656-2

Page 1 of 1

<b>Sample Description</b>	Air Quality			
<b>Location</b>	วัดคลองกรำ (A2)			
<b>Date Analysis Commenced</b>	Mar 19, 2025			
<b>Condition of Sample</b>	Drawn into one glass filter paper (8x10 inch) placed in plastic bag			
Sample Number	Sampled Date	Total Suspended Particulate (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2521680-8	Mar 08 - Mar 09, 2025	0.060	759*	31.2*
2521680-9	Mar 09 - Mar 10, 2025	0.084	759*	31.4*
2521680-10	Mar 10 - Mar 11, 2025	0.098	759*	32.6*
2521680-11	Mar 11 - Mar 12, 2025	0.080	759*	31.4*
2521680-12	Mar 12 - Mar 13, 2025	0.073	759*	32.2*
2521680-13	Mar 13 - Mar 14, 2025	0.060	759*	31.6*
2521680-14	Mar 14 - Mar 15, 2025	0.079	759*	32.6*
<b>Guideline</b>		0.33	-	-

### Reference Method

Total Suspended Particulate : United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008

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

**Sampled By :** Santi Chaichana

**Remark :** Result (s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.

-

Approved by

*Thanita K.*

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Scientist (4)

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## Analysis / Test Report

TESTING  
No.0042

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**

**Lot ID: 2521680**

Date Received : Mar 18, 2025  
Date Reported : Mar 22, 2025  
Report Number: 3251656-3

Page 1 of 1

<b>Sample Description</b>	Air Quality			
<b>Location</b>	วัดราษฎร์ศรัทธาธรรม (A3)			
<b>Date Analysis Commenced</b>	Mar 19, 2025			
<b>Condition of Sample</b>	Drawn into one glass filter paper (8x10 inch) placed in plastic bag			
Sample Number	Sampled Date	Total Suspended Particulate (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2521680-15	Mar 08 - Mar 09, 2025	0.051	759*	31.2*
2521680-16	Mar 09 - Mar 10, 2025	0.109	759*	31.4*
2521680-17	Mar 10 - Mar 11, 2025	0.105	759*	32.6*
2521680-18	Mar 11 - Mar 12, 2025	0.082	759*	31.4*
2521680-19	Mar 12 - Mar 13, 2025	0.064	759*	32.2*
2521680-20	Mar 13 - Mar 14, 2025	0.075	759*	31.6*
2521680-21	Mar 14 - Mar 15, 2025	0.092	759*	32.6*
<b>Guideline</b>		0.33	-	-

### Reference Method

Total Suspended Particulate : United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008

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

**Sampled By :** Santi Chaichana

**Remark :** Result (s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.

-

Approved by

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Scientist (4)

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## Analysis / Test Report

Client : Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

Lot ID: 2521681  
Date Received : Mar 18, 2025  
Date Reported : Mar 25, 2025  
Report Number : 3251657-1

P/O : PO241110529  
Project Name : Monitoring  
Project Location :

Page 1 of 2

Sample Number : 2521681-1 to 7  
Parameter : Wind Speed / Wind Direction  
Location : วัดราษฎร์ศุภคาราม (A3)  
Sampling Date : Mar 08 - Mar 15, 2025  
Sampling by : Santi Chaichana

Time	Mar 08 - Mar 09, 2025			Mar 09 - Mar 10, 2025			Mar 10 - Mar 11, 2025			Mar 11 - Mar 12, 2025			Mar 12 - Mar 13, 2025			Mar 13 - Mar 14, 2025			Mar 14 - Mar 15, 2025		
	WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)	
03:00 PM - 04:00 PM	1.5	86.0	E	3.3	331.0	NNW	0.8	194.0	SSW	2.8	66.0	ENE	0.2	-	-	1.0	67.0	ENE	2.0	55.0	NE
04:00 PM - 05:00 PM	1.5	152.0	SSE	3.1	73.0	ENE	0.9	111.0	ESE	0.3	0.0	N	1.5	348.0	NNW	0.6	61.0	ENE	1.5	336.0	NNW
05:00 PM - 06:00 PM	0.5	103.0	ESE	0.0	-	-	2.1	122.0	ESE	0.4	156.0	SSE	0.1	-	-	1.0	61.0	ENE	2.2	333.0	NNW
06:00 PM - 07:00 PM	0.5	105.0	ESE	2.1	111.0	ESE	1.0	99.0	E	0.1	-	-	1.0	320.0	NW	0.5	74.0	ENE	1.0	333.0	NNW
07:00 PM - 08:00 PM	0.0	-	-	0.5	236.0	SW	0.8	84.0	E	0.2	-	-	0.0	-	-	0.9	6.0	N	0.3	328.0	NNW
08:00 PM - 09:00 PM	0.0	-	-	0.0	-	-	0.5	134.0	SE	0.1	-	-	0.3	92.0	E	0.2	-	-	0.5	244.0	WSW
09:00 PM - 10:00 PM	0.0	-	-	0.5	81.0	E	0.0	-	-	0.3	308.0	NW	0.8	65.0	ENE	0.9	221.0	SW	0.4	215.0	SW
10:00 PM - 11:00 PM	0.6	0.0	N	0.0	-	-	0.0	-	-	0.3	308.0	NW	0.3	88.0	E	0.4	225.0	SW	0.7	282.0	WNW
11:00 PM - 12:00 AM	0.0	-	-	0.1	-	-	0.3	287.0	WNW	0.5	344.0	NNW	0.2	-	-	0.2	-	-	0.6	99.0	E
12:00 AM - 01:00 AM	0.2	-	-	0.0	-	-	0.2	-	-	0.2	-	-	0.2	-	-	1.0	235.0	SW	0.2	-	-
01:00 AM - 02:00 AM	0.0	-	-	0.0	-	-	0.5	262.0	W	0.5	356.0	N	0.2	-	-	0.8	65.0	ENE	0.4	261.0	W
02:00 AM - 03:00 AM	0.3	68.0	ENE	0.0	-	-	0.3	239.0	WSW	0.0	-	-	0.1	-	-	0.6	336.0	NNW	0.3	301.0	WNW
03:00 AM - 04:00 AM	0.0	-	-	0.0	-	-	0.0	-	-	0.5	300.0	WNW	0.0	-	-	0.7	240.0	WSW	0.1	-	-
04:00 AM - 05:00 AM	0.0	-	-	0.0	-	-	1.0	123.0	ESE	0.2	-	-	0.3	326.0	NW	0.5	337.0	NNW	0.0	-	-
05:00 AM - 06:00 AM	0.6	0.0	N	0.3	327.0	NNW	0.6	317.0	NW	0.6	327.0	NNW	0.0	-	-	0.3	79.0	E	0.6	117.0	ESE
06:00 AM - 07:00 AM	0.0	-	-	0.0	-	-	0.5	348.0	NNW	0.0	-	-	1.0	326.0	NW	1.0	200.0	SSW	0.5	128.0	SE
07:00 AM - 08:00 AM	0.1	-	-	1.3	238.0	WSW	0.6	56.0	NE	0.2	-	-	1.2	92.0	E	0.5	117.0	ESE	0.4	105.0	ESE
08:00 AM - 09:00 AM	1.3	215.0	SW	1.7	209.0	SSW	0.0	-	-	0.1	-	-	1.0	158.0	SSE	0.8	242.0	WSW	0.8	90.0	E
09:00 AM - 10:00 AM	2.0	219.0	SW	1.2	276.0	W	1.0	111.0	ESE	0.6	130.0	SE	0.8	109.0	ESE	1.0	256.0	WSW	0.3	140.0	SE
10:00 AM - 11:00 AM	1.0	211.0	SSW	0.9	93.0	E	1.6	229.0	SW	0.7	80.0	E	0.2	-	-	1.1	87.0	E	0.4	33.0	NNE
11:00 AM - 12:00 PM	0.6	229.0	SW	1.9	309.0	NW	1.6	37.0	NE	0.7	259.0	W	0.5	99.0	E	0.2	-	-	0.2	-	-
12:00 PM - 01:00 PM	0.0	-	-	2.1	255.0	WSW	1.0	345.0	NNW	1.6	324.0	NW	0.4	93.0	E	0.5	131.0	SE	0.6	293.0	WNW
01:00 PM - 02:00 PM	0.5	330.0	NNW	1.1	295.0	WNW	0.6	252.0	WSW	2.0	3.0	N	2.0	93.0	E	0.6	56.0	NE	0.4	282.0	WNW
02:00 PM - 03:00 PM	1.3	234.0	SW	2.1	324.0	NW	1.6	0.0	N	0.9	306.0	NW	1.3	6.0	N	0.4	56.0	NE	0.8	268.0	W

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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 form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by

Sarayuth Jittrantont  
Assistant General Manager



## Analysis / Test Report

Client : Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

Lot ID: 2521681  
Date Received : Mar 18, 2025  
Date Reported : Mar 25, 2025  
Report Number : 3251657-1

P/O : PO241110529  
Project Name : Monitoring  
Project Location :

Page 2 of 2

### Wind Rose



Date : Mar 08-09, 2025



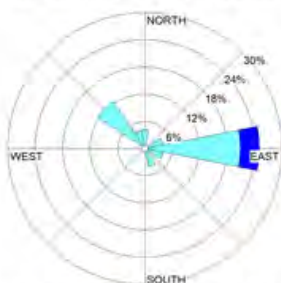
Date : Mar 09-10, 2025



Date : Mar 10-11, 2025



Date : Mar 11-12, 2025



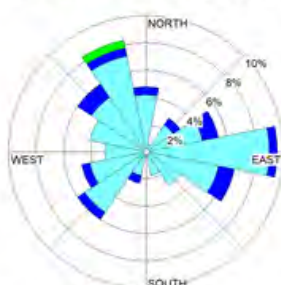
Date : Mar 12-13, 2025



Date : Mar 13-14, 2025



Date : Mar 14-15, 2025



Date : Mar 08-15, 2025

WS (m/s)	%
≥ 10.0	0.00
8.0-10.0	0.00
5.5-8.0	0.00
3.3-5.5	0.60
1.7-3.3	7.74
0.3-1.7	60.71
Calms	30.95

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 form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by

Sarayuth Jitranont  
Assistant General Manager

# ภาคผนวก ค-3

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ระดับเสียงโดยทั่วไป



## Analysis / Test Report

TESTING  
No.0042

**Client :** Kiri (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

**P/O :** PO241110529

**Project Name :** Monitoring

**Project Location :**

**Lot ID: 2521682**

Date Received : Mar 18, 2025

Date Reported : Mar 24, 2025

Report Number: 3265161-1

Page 1 of 1

**Sample Number** 2521682-1  
**Parameter** Noise (Leq 24 hrs.)  
**Location** รีมรั้วโครงการ ทิศเหนือ  
**Measurement Date** Mar 11 - Mar 12, 2025  
**Measurement by** Santi Chaichana  
**Sound Level meter** Serial No. 623390

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
01:00 PM - 02:00 PM	55.6	76.1	53.1
02:00 PM - 03:00 PM	54.9	68.1	52.9
03:00 PM - 04:00 PM	55.6	75.3	52.9
04:00 PM - 05:00 PM	60.7	83.8	54.9
05:00 PM - 06:00 PM	55.2	69.9	52.4
06:00 PM - 07:00 PM	55.1	76.4	52.4
07:00 PM - 08:00 PM	55.2	80.0	52.2
08:00 PM - 09:00 PM	55.2	76.3	52.1
09:00 PM - 10:00 PM	53.8	72.8	51.2
10:00 PM - 11:00 PM	52.1	69.6	50.1
11:00 PM - 12:00 AM	50.9	67.2	48.6
12:00 AM - 01:00 AM	51.8	65.3	50.6
01:00 AM - 02:00 AM	53.4	77.3	50.9
02:00 AM - 03:00 AM	51.1	67.3	49.6
03:00 AM - 04:00 AM	49.4	65.0	48.1
04:00 AM - 05:00 AM	50.3	63.9	48.3
05:00 AM - 06:00 AM	53.8	66.7	52.0
06:00 AM - 07:00 AM	56.2	81.7	52.3
07:00 AM - 08:00 AM	56.1	75.6	53.1
08:00 AM - 09:00 AM	59.4	82.9	54.9
09:00 AM - 10:00 AM	55.7	73.4	52.9
10:00 AM - 11:00 AM	54.5	72.1	52.3
11:00 AM - 12:00 PM	55.2	77.5	52.2
12:00 PM - 01:00 PM	54.7	70.5	53.5

Leq Average 24 hrs. (dB(A)) 55.2  
Lmax (dB(A)) 83.8  
L90 (dB(A)) 52.2  
Ldn (dB(A)) 59.8

Standard (dB(A)) 70 115

Reference Method : ISO1996-1 and 1996-2

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

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

**Technical Management**

Chontichak

Chonticha Subongkoch  
Scientist (3)

**Approved by**

Supot S

Supot Salamteh  
Section Head

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## Analysis / Test Report

TESTING  
No.0042

**Client :** Kiri (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

**P/O :** PO241110529

**Project Name :** Monitoring

**Project Location :**

**Lot ID: 2521682**

Date Received : Mar 18, 2025

Date Reported : Mar 24, 2025

Report Number: 3265162-1

Page 1 of 1

**Sample Number** 2521682-2  
**Parameter** Noise (Leq 24 hrs.)  
**Location** รีมรั้วโครงการ ทิศเหนือ  
**Measurement Date** Mar 12 - Mar 13, 2025  
**Measurement by** Santi Chaichana  
**Sound Level meter** Serial No. 623390

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
01:00 PM - 02:00 PM	56.1	73.9	53.6
02:00 PM - 03:00 PM	55.1	71.0	53.1
03:00 PM - 04:00 PM	54.4	73.7	52.9
04:00 PM - 05:00 PM	54.3	68.7	52.6
05:00 PM - 06:00 PM	55.3	77.7	52.0
06:00 PM - 07:00 PM	54.5	73.0	52.5
07:00 PM - 08:00 PM	53.8	73.3	51.9
08:00 PM - 09:00 PM	55.7	80.8	52.5
09:00 PM - 10:00 PM	54.9	75.1	52.6
10:00 PM - 11:00 PM	54.0	66.6	52.3
11:00 PM - 12:00 AM	53.2	72.7	51.6
12:00 AM - 01:00 AM	53.6	67.0	52.7
01:00 AM - 02:00 AM	53.9	68.4	52.4
02:00 AM - 03:00 AM	52.7	67.5	51.7
03:00 AM - 04:00 AM	52.7	62.4	51.7
04:00 AM - 05:00 AM	52.9	68.6	51.8
05:00 AM - 06:00 AM	55.3	74.9	53.8
06:00 AM - 07:00 AM	55.9	72.4	53.3
07:00 AM - 08:00 AM	56.5	71.6	53.2
08:00 AM - 09:00 AM	57.1	82.7	53.4
09:00 AM - 10:00 AM	54.4	76.6	52.2
10:00 AM - 11:00 AM	55.3	77.8	53.0
11:00 AM - 12:00 PM	54.7	69.9	52.2
12:00 PM - 01:00 PM	56.5	71.9	53.5

Leq Average 24 hrs. (dB(A)) 54.9  
Lmax (dB(A)) 82.7  
L90 (dB(A)) 52.5  
Ldn (dB(A)) 60.6  
Standard (dB(A)) 70 115

Reference Method : ISO1996-1 and 1996-2

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

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

**Technical Management**

Chontichak

Chonticha Subongkoch  
Scientist (3)

**Approved by**

Supot S

Supot Salamteh  
Section Head

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## Analysis / Test Report

TESTING  
No.0042

**Client :** Kiri (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

**P/O :** PO241110529

**Project Name :** Monitoring

**Project Location :**

**Lot ID: 2521682**

Date Received : Mar 18, 2025

Date Reported : Mar 24, 2025

Report Number: 3265163-1

Page 1 of 1

**Sample Number** 2521682-3  
**Parameter** Noise (Leq 24 hrs.)  
**Location** รีมรั้วโครงการ ทิศเหนือ  
**Measurement Date** Mar 13 - Mar 14, 2025  
**Measurement by** Santi Chaichana  
**Sound Level meter** Serial No. 623390

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
01:00 PM - 02:00 PM	56.4	72.0	53.9
02:00 PM - 03:00 PM	55.5	72.4	53.2
03:00 PM - 04:00 PM	60.0	91.2	53.6
04:00 PM - 05:00 PM	62.4	79.6	59.8
05:00 PM - 06:00 PM	58.8	77.9	55.2
06:00 PM - 07:00 PM	55.2	71.7	53.4
07:00 PM - 08:00 PM	55.2	74.0	53.0
08:00 PM - 09:00 PM	56.3	75.6	53.8
09:00 PM - 10:00 PM	54.9	77.2	52.7
10:00 PM - 11:00 PM	52.9	75.4	51.3
11:00 PM - 12:00 AM	52.4	74.6	50.2
12:00 AM - 01:00 AM	51.2	64.6	50.2
01:00 AM - 02:00 AM	52.7	71.4	51.3
02:00 AM - 03:00 AM	52.8	67.1	51.2
03:00 AM - 04:00 AM	51.9	67.4	49.8
04:00 AM - 05:00 AM	51.2	70.6	49.7
05:00 AM - 06:00 AM	54.4	77.5	52.6
06:00 AM - 07:00 AM	56.9	75.7	53.1
07:00 AM - 08:00 AM	56.6	73.0	53.5
08:00 AM - 09:00 AM	57.6	81.2	53.8
09:00 AM - 10:00 AM	55.7	71.6	52.8
10:00 AM - 11:00 AM	54.8	71.7	52.9
11:00 AM - 12:00 PM	55.6	78.6	52.8
12:00 PM - 01:00 PM	54.7	70.1	52.2

Leq Average 24 hrs. (dB(A)) 56.2  
Lmax (dB(A)) 91.2  
L90 (dB(A)) 52.8  
Ldn (dB(A)) 60.6

Standard (dB(A)) 70 115

Reference Method : ISO1996-1 and 1996-2

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

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

**Technical Management**

Chontichak

Chonticha Subongkoch  
Scientist (3)

**Approved by**

Supot S

Supot Salamteh  
Section Head

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## Analysis / Test Report

TESTING  
No.0042

**Client :** Kiri (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

**P/O :** PO241110529

**Project Name :** Monitoring

**Project Location :**

**Lot ID: 2521682**

Date Received : Mar 18, 2025

Date Reported : Mar 24, 2025

Report Number: 3265164-1

Page 1 of 1

**Sample Number** 2521682-4  
**Parameter** Noise (Leq 24 hrs.)  
**Location** รีมรั้วโครงการ ทิศใต้  
**Measurement Date** Mar 11 - Mar 12, 2025  
**Measurement by** Santi Chaichana  
**Sound Level meter** Serial No. 623387

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
01:00 PM - 02:00 PM	67.4	89.0	66.7
02:00 PM - 03:00 PM	67.7	77.2	67.1
03:00 PM - 04:00 PM	67.1	78.2	66.3
04:00 PM - 05:00 PM	67.6	88.5	67.0
05:00 PM - 06:00 PM	67.5	78.3	66.9
06:00 PM - 07:00 PM	67.5	79.4	67.0
07:00 PM - 08:00 PM	67.0	80.0	66.4
08:00 PM - 09:00 PM	67.1	79.7	66.6
09:00 PM - 10:00 PM	67.1	77.7	66.6
10:00 PM - 11:00 PM	67.0	79.9	66.5
11:00 PM - 12:00 AM	66.8	79.6	66.2
12:00 AM - 01:00 AM	66.7	78.1	66.3
01:00 AM - 02:00 AM	67.4	79.9	66.9
02:00 AM - 03:00 AM	67.1	79.7	66.7
03:00 AM - 04:00 AM	67.5	80.3	67.1
04:00 AM - 05:00 AM	67.6	79.9	67.2
05:00 AM - 06:00 AM	67.1	69.9	66.6
06:00 AM - 07:00 AM	67.6	79.7	67.2
07:00 AM - 08:00 AM	67.9	79.6	67.4
08:00 AM - 09:00 AM	68.0	88.8	67.1
09:00 AM - 10:00 AM	67.1	79.4	66.5
10:00 AM - 11:00 AM	67.2	76.6	66.4
11:00 AM - 12:00 PM	67.3	76.9	66.3
12:00 PM - 01:00 PM	66.9	77.2	65.9

Leq Average 24 hrs. (dB(A)) 67.3  
Lmax (dB(A)) 89.0  
L90 (dB(A)) 66.6  
Ldn (dB(A)) 73.6

Standard (dB(A)) 70 115

Reference Method : ISO1996-1 and 1996-2

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

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

**Technical Management**

Chontichak

Chonticha Subongkoch  
Scientist (3)

**Approved by**

Supot S

Supot Salamteh  
Section Head

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## Analysis / Test Report

TESTING  
No.0042

**Client :** Kiri (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

**P/O :** PO241110529

**Project Name :** Monitoring

**Project Location :**

**Lot ID: 2521682**

Date Received : Mar 18, 2025

Date Reported : Mar 24, 2025

Report Number: 3265165-1

Page 1 of 1

**Sample Number** 2521682-5  
**Parameter** Noise (Leq 24 hrs.)  
**Location** ร่มรั้วโครงการ ทิศใต้  
**Measurement Date** Mar 12 - Mar 13, 2025  
**Measurement by** Santi Chaichana  
**Sound Level meter** Serial No. 623387

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
01:00 PM - 02:00 PM	66.7	79.4	65.8
02:00 PM - 03:00 PM	66.3	77.5	65.5
03:00 PM - 04:00 PM	66.3	77.4	65.6
04:00 PM - 05:00 PM	66.3	77.3	65.3
05:00 PM - 06:00 PM	67.0	77.5	66.2
06:00 PM - 07:00 PM	67.1	77.5	66.6
07:00 PM - 08:00 PM	58.5	77.7	56.7
08:00 PM - 09:00 PM	57.2	74.4	56.5
09:00 PM - 10:00 PM	57.2	67.0	56.7
10:00 PM - 11:00 PM	56.9	65.0	56.5
11:00 PM - 12:00 AM	56.7	74.0	56.3
12:00 AM - 01:00 AM	56.6	67.1	56.2
01:00 AM - 02:00 AM	56.6	67.9	56.2
02:00 AM - 03:00 AM	56.8	66.5	56.4
03:00 AM - 04:00 AM	56.7	64.3	56.2
04:00 AM - 05:00 AM	56.7	61.1	56.2
05:00 AM - 06:00 AM	62.0	65.4	61.5
06:00 AM - 07:00 AM	62.9	84.7	62.4
07:00 AM - 08:00 AM	63.0	71.9	62.1
08:00 AM - 09:00 AM	67.8	80.4	67.3
09:00 AM - 10:00 AM	67.2	83.2	66.6
10:00 AM - 11:00 AM	66.6	77.4	65.9
11:00 AM - 12:00 PM	66.7	76.6	66.0
12:00 PM - 01:00 PM	67.1	83.3	66.3

Leq Average 24 hrs. (dB(A)) 64.2  
Lmax (dB(A)) 84.7  
L90 (dB(A)) 62.1  
Ldn (dB(A)) 67.2

Standard (dB(A)) 70 115

Reference Method : ISO1996-1 and 1996-2

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

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

**Technical Management**

Chontichak

Chonticha Subongkoch  
Scientist (3)

**Approved by**

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Section Head

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## Analysis / Test Report

TESTING  
No.0042

**Client :** Kiri (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

**P/O :** PO241110529

**Project Name :** Monitoring

**Project Location :**

**Lot ID: 2521682**

Date Received : Mar 18, 2025

Date Reported : Mar 24, 2025

Report Number: 3265166-1

Page 1 of 1

**Sample Number** 2521682-6  
**Parameter** Noise (Leq 24 hrs.)  
**Location** รีมรั้วโครงการ ทิศใต้  
**Measurement Date** Mar 13 - Mar 14, 2025  
**Measurement by** Santi Chaichana  
**Sound Level meter** Serial No. 623387

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
01:00 PM - 02:00 PM	66.8	77.0	66.1
02:00 PM - 03:00 PM	66.6	77.1	65.8
03:00 PM - 04:00 PM	66.8	84.7	65.7
04:00 PM - 05:00 PM	67.9	82.0	67.0
05:00 PM - 06:00 PM	67.1	77.4	66.5
06:00 PM - 07:00 PM	67.2	79.4	66.7
07:00 PM - 08:00 PM	67.2	80.4	66.6
08:00 PM - 09:00 PM	67.3	79.7	66.9
09:00 PM - 10:00 PM	67.4	80.8	66.9
10:00 PM - 11:00 PM	67.2	81.2	66.6
11:00 PM - 12:00 AM	67.0	80.5	66.5
12:00 AM - 01:00 AM	66.7	80.5	66.2
01:00 AM - 02:00 AM	67.1	80.3	66.6
02:00 AM - 03:00 AM	67.3	78.8	66.8
03:00 AM - 04:00 AM	66.9	79.8	66.4
04:00 AM - 05:00 AM	67.0	80.2	66.5
05:00 AM - 06:00 AM	67.0	82.3	66.5
06:00 AM - 07:00 AM	67.2	78.7	66.8
07:00 AM - 08:00 AM	67.4	80.3	67.0
08:00 AM - 09:00 AM	67.7	79.7	67.1
09:00 AM - 10:00 AM	67.3	77.6	66.7
10:00 AM - 11:00 AM	67.0	77.5	66.4
11:00 AM - 12:00 PM	67.3	77.5	66.7
12:00 PM - 01:00 PM	67.0	82.4	66.2

Leq Average 24 hrs. (dB(A)) 67.2  
Lmax (dB(A)) 84.7  
L90 (dB(A)) 66.6  
Ldn (dB(A)) 73.5

Standard (dB(A)) 70 115

Reference Method : ISO1996-1 and 1996-2

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

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

**Technical Management**

Chontichak

Chonticha Subongkoch  
Scientist (3)

**Approved by**

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Supot Salamteh  
Section Head

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## Analysis / Test Report

TESTING  
No.0042

**Client :** Kiri (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

**P/O :** PO241110529

**Project Name :** Monitoring

**Project Location :**

**Lot ID: 2521682**

Date Received : Mar 18, 2025

Date Reported : Mar 24, 2025

Report Number: 3265167-1

Page 1 of 1

**Sample Number** 2521682-7  
**Parameter** Noise (Leq 24 hrs.)  
**Location** รีมรั้วโครงการ ทิศตะวันออก  
**Measurement Date** Mar 11 - Mar 12, 2025  
**Measurement by** Santi Chaichana  
**Sound Level meter** Serial No. 900074

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
01:00 PM - 02:00 PM	60.0	89.0	55.9
02:00 PM - 03:00 PM	59.1	84.0	55.3
03:00 PM - 04:00 PM	59.0	79.7	56.3
04:00 PM - 05:00 PM	62.9	96.1	57.3
05:00 PM - 06:00 PM	57.1	76.3	55.5
06:00 PM - 07:00 PM	61.6	89.2	55.7
07:00 PM - 08:00 PM	57.3	84.5	54.2
08:00 PM - 09:00 PM	57.1	89.3	55.3
09:00 PM - 10:00 PM	59.0	85.0	55.0
10:00 PM - 11:00 PM	60.4	88.6	55.3
11:00 PM - 12:00 AM	57.7	83.9	54.9
12:00 AM - 01:00 AM	60.7	83.0	59.1
01:00 AM - 02:00 AM	60.5	88.6	55.6
02:00 AM - 03:00 AM	57.8	82.8	55.3
03:00 AM - 04:00 AM	57.0	79.0	55.6
04:00 AM - 05:00 AM	58.0	80.0	55.4
05:00 AM - 06:00 AM	56.3	80.5	54.6
06:00 AM - 07:00 AM	64.3	89.5	61.1
07:00 AM - 08:00 AM	56.1	76.4	54.4
08:00 AM - 09:00 AM	60.2	95.0	56.6
09:00 AM - 10:00 AM	59.2	82.2	56.0
10:00 AM - 11:00 AM	57.7	80.9	55.7
11:00 AM - 12:00 PM	58.5	81.9	55.5
12:00 PM - 01:00 PM	56.4	72.9	53.4

Leq Average 24 hrs. (dB(A)) 59.5  
Lmax (dB(A)) 96.1  
L90 (dB(A)) 55.5  
Ldn (dB(A)) 66.2

Standard (dB(A)) 70 115

Reference Method : ISO1996-1 and 1996-2

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

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

**Technical Management**

Chontichak

Chonticha Subongkoch  
Scientist (3)

**Approved by**

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Supot Salamteh  
Section Head

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## Analysis / Test Report

TESTING  
No.0042

**Client :** Kiri (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

**P/O :** PO241110529

**Project Name :** Monitoring

**Project Location :**

**Lot ID: 2521682**

Date Received : Mar 18, 2025

Date Reported : Mar 24, 2025

Report Number: 3265168-1

Page 1 of 1

**Sample Number** 2521682-8  
**Parameter** Noise (Leq 24 hrs.)  
**Location** รีมรั้วโครงการ ทิศตะวันออก  
**Measurement Date** Mar 12 - Mar 13, 2025  
**Measurement by** Santi Chaichana  
**Sound Level meter** Serial No. 900074

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
01:00 PM - 02:00 PM	59.8	77.0	56.4
02:00 PM - 03:00 PM	59.4	80.6	56.8
03:00 PM - 04:00 PM	58.5	82.7	56.2
04:00 PM - 05:00 PM	58.7	86.8	56.3
05:00 PM - 06:00 PM	55.8	78.8	54.4
06:00 PM - 07:00 PM	60.7	82.9	55.3
07:00 PM - 08:00 PM	55.0	77.1	53.2
08:00 PM - 09:00 PM	55.8	84.1	53.8
09:00 PM - 10:00 PM	58.6	85.0	54.3
10:00 PM - 11:00 PM	60.5	78.7	57.2
11:00 PM - 12:00 AM	57.0	89.0	53.9
12:00 AM - 01:00 AM	52.4	72.8	51.1
01:00 AM - 02:00 AM	58.8	85.2	53.6
02:00 AM - 03:00 AM	59.0	88.3	53.8
03:00 AM - 04:00 AM	57.0	86.0	53.6
04:00 AM - 05:00 AM	55.1	81.1	53.2
05:00 AM - 06:00 AM	54.3	73.6	52.7
06:00 AM - 07:00 AM	62.6	84.2	58.2
07:00 AM - 08:00 AM	55.0	78.7	51.5
08:00 AM - 09:00 AM	57.6	82.8	55.2
09:00 AM - 10:00 AM	59.3	80.3	55.8
10:00 AM - 11:00 AM	58.1	82.5	55.3
11:00 AM - 12:00 PM	58.2	79.3	55.3
12:00 PM - 01:00 PM	56.5	80.4	54.6

Leq Average 24 hrs. (dB(A)) 58.2  
Lmax (dB(A)) 89.0  
L90 (dB(A)) 54.4  
Ldn (dB(A)) 64.8

Standard (dB(A)) 70 115

Reference Method : ISO1996-1 and 1996-2

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

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

**Technical Management**

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Chonticha Subongkoch  
Scientist (3)

**Approved by**

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Supot Salamteh  
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## Analysis / Test Report

TESTING  
No.0042

**Client :** Kiri (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

**P/O :** PO241110529

**Project Name :** Monitoring

**Project Location :**

**Lot ID: 2521682**

Date Received : Mar 18, 2025

Date Reported : Mar 24, 2025

Report Number: 3265169-1

Page 1 of 1

**Sample Number** 2521682-9  
**Parameter** Noise (Leq 24 hrs.)  
**Location** รีมรั้วโครงการ ทิศตะวันออก  
**Measurement Date** Mar 13 - Mar 14, 2025  
**Measurement by** Santi Chaichana  
**Sound Level meter** Serial No. 900074

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
01:00 PM - 02:00 PM	59.5	84.6	55.9
02:00 PM - 03:00 PM	58.7	81.1	55.5
03:00 PM - 04:00 PM	60.1	84.7	56.6
04:00 PM - 05:00 PM	65.0	84.2	63.3
05:00 PM - 06:00 PM	59.2	78.7	57.3
06:00 PM - 07:00 PM	59.7	81.4	55.9
07:00 PM - 08:00 PM	57.3	80.2	55.0
08:00 PM - 09:00 PM	58.6	82.1	56.1
09:00 PM - 10:00 PM	60.8	85.7	56.3
10:00 PM - 11:00 PM	59.2	88.8	56.3
11:00 PM - 12:00 AM	59.6	87.2	56.3
12:00 AM - 01:00 AM	55.9	76.3	54.6
01:00 AM - 02:00 AM	57.9	87.6	55.3
02:00 AM - 03:00 AM	60.9	85.4	56.6
03:00 AM - 04:00 AM	58.3	85.6	55.7
04:00 AM - 05:00 AM	58.0	83.1	56.1
05:00 AM - 06:00 AM	56.6	76.3	55.5
06:00 AM - 07:00 AM	60.9	84.1	56.3
07:00 AM - 08:00 AM	56.8	81.1	54.3
08:00 AM - 09:00 AM	58.4	83.4	56.1
09:00 AM - 10:00 AM	62.6	85.5	57.4
10:00 AM - 11:00 AM	65.1	85.4	59.4
11:00 AM - 12:00 PM	60.7	83.5	57.3
12:00 PM - 01:00 PM	57.3	81.2	54.5

Leq Average 24 hrs. (dB(A)) 60.2  
Lmax (dB(A)) 88.8  
L90 (dB(A)) 56.1  
Ldn (dB(A)) 65.6  
Standard (dB(A)) 70 115

Reference Method : ISO1996-1 and 1996-2

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

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

**Technical Management**

*Chontichak*

Chonticha Subongkoch  
Scientist (3)

**Approved by**

*Supot S*

Supot Salamteh  
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## Analysis / Test Report

TESTING  
No.0042

**Client :** Kiri (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

**P/O :** PO241110529

**Project Name :** Monitoring

**Project Location :**

**Lot ID: 2521682**

Date Received : Mar 18, 2025

Date Reported : Mar 24, 2025

Report Number: 3265170-1

Page 1 of 1

**Sample Number** 2521682-10  
**Parameter** Noise (Leq 24 hrs.)  
**Location** รีมรั้วโครงการ ทิศตะวันตก  
**Measurement Date** Mar 11 - Mar 12, 2025  
**Measurement by** Santi Chaichana  
**Sound Level meter** Serial No. 623389

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
01:00 PM - 02:00 PM	65.5	84.4	63.9
02:00 PM - 03:00 PM	65.5	83.1	63.7
03:00 PM - 04:00 PM	65.6	84.2	63.6
04:00 PM - 05:00 PM	66.1	85.0	63.9
05:00 PM - 06:00 PM	65.9	83.4	63.9
06:00 PM - 07:00 PM	66.1	92.1	63.9
07:00 PM - 08:00 PM	65.1	86.9	63.9
08:00 PM - 09:00 PM	64.8	85.9	63.6
09:00 PM - 10:00 PM	63.8	81.0	62.0
10:00 PM - 11:00 PM	63.5	81.7	61.7
11:00 PM - 12:00 AM	62.8	85.4	61.0
12:00 AM - 01:00 AM	62.2	68.3	61.2
01:00 AM - 02:00 AM	63.3	82.9	61.3
02:00 AM - 03:00 AM	64.2	86.3	61.3
03:00 AM - 04:00 AM	62.3	81.8	61.2
04:00 AM - 05:00 AM	63.8	82.9	61.4
05:00 AM - 06:00 AM	65.2	81.9	64.2
06:00 AM - 07:00 AM	65.9	79.9	64.6
07:00 AM - 08:00 AM	66.0	85.2	64.5
08:00 AM - 09:00 AM	66.4	89.2	64.3
09:00 AM - 10:00 AM	66.0	83.1	64.4
10:00 AM - 11:00 AM	65.5	88.0	64.0
11:00 AM - 12:00 PM	65.2	84.4	63.6
12:00 PM - 01:00 PM	64.7	84.6	63.7

Leq Average 24 hrs. (dB(A)) 65.0  
Lmax (dB(A)) 92.1  
L90 (dB(A)) 63.7  
Ldn (dB(A)) 70.5

Standard (dB(A)) 70 115

Reference Method : ISO1996-1 and 1996-2

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

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

Technical Management

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## Analysis / Test Report

TESTING  
No.0042

**Client :** Kiri (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

**P/O :** PO241110529

**Project Name :** Monitoring

**Project Location :**

**Lot ID: 2521682**

Date Received : Mar 18, 2025

Date Reported : Mar 24, 2025

Report Number: 3265171-1

Page 1 of 1

**Sample Number** 2521682-11  
**Parameter** Noise (Leq 24 hrs.)  
**Location** รีมรั้วโครงการ ทิศตะวันตก  
**Measurement Date** Mar 12 - Mar 13, 2025  
**Measurement by** Santi Chaichana  
**Sound Level meter** Serial No. 623389

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
01:00 PM - 02:00 PM	65.3	82.0	63.6
02:00 PM - 03:00 PM	65.1	83.4	63.6
03:00 PM - 04:00 PM	65.3	89.6	63.7
04:00 PM - 05:00 PM	65.3	80.8	63.9
05:00 PM - 06:00 PM	65.3	87.8	63.8
06:00 PM - 07:00 PM	65.1	83.1	64.0
07:00 PM - 08:00 PM	64.8	78.6	63.7
08:00 PM - 09:00 PM	65.2	86.2	63.7
09:00 PM - 10:00 PM	65.8	87.3	63.8
10:00 PM - 11:00 PM	65.7	84.4	63.8
11:00 PM - 12:00 AM	64.8	81.3	63.7
12:00 AM - 01:00 AM	64.6	82.7	63.7
01:00 AM - 02:00 AM	65.5	84.0	63.9
02:00 AM - 03:00 AM	65.1	81.3	63.7
03:00 AM - 04:00 AM	64.7	80.6	63.8
04:00 AM - 05:00 AM	65.3	82.5	63.7
05:00 AM - 06:00 AM	64.9	84.5	63.9
06:00 AM - 07:00 AM	65.4	82.3	63.9
07:00 AM - 08:00 AM	65.5	80.6	64.2
08:00 AM - 09:00 AM	66.1	83.8	64.3
09:00 AM - 10:00 AM	65.4	81.8	64.0
10:00 AM - 11:00 AM	65.3	82.4	64.0
11:00 AM - 12:00 PM	65.3	84.3	63.8
12:00 PM - 01:00 PM	65.6	81.2	64.3

Leq Average 24 hrs. (dB(A)) 65.3  
Lmax (dB(A)) 89.6  
L90 (dB(A)) 63.8  
Ldn (dB(A)) 71.6

Standard (dB(A)) 70 115

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป  
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Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch  
Scientist (3)

Approved by

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Supot Salamteh  
Section Head

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## Analysis / Test Report

TESTING  
No.0042

**Client :** Kiri (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

**P/O :** PO241110529

**Project Name :** Monitoring

**Project Location :**

**Lot ID: 2521682**

Date Received : Mar 18, 2025

Date Reported : Mar 24, 2025

Report Number: 3265172-1

Page 1 of 1

**Sample Number** 2521682-12  
**Parameter** Noise (Leq 24 hrs.)  
**Location** รีมรั้วโครงการ ทิศตะวันตก  
**Measurement Date** Mar 13 - Mar 14, 2025  
**Measurement by** Santi Chaichana  
**Sound Level meter** Serial No. 623389

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
01:00 PM - 02:00 PM	65.7	83.4	64.2
02:00 PM - 03:00 PM	65.2	82.3	63.8
03:00 PM - 04:00 PM	66.5	86.8	64.0
04:00 PM - 05:00 PM	67.7	82.4	66.6
05:00 PM - 06:00 PM	66.8	83.5	65.4
06:00 PM - 07:00 PM	66.2	81.7	64.9
07:00 PM - 08:00 PM	65.8	79.7	64.8
08:00 PM - 09:00 PM	66.4	91.6	64.7
09:00 PM - 10:00 PM	64.5	85.5	63.0
10:00 PM - 11:00 PM	64.2	85.0	61.3
11:00 PM - 12:00 AM	62.1	76.7	61.2
12:00 AM - 01:00 AM	61.5	70.7	60.7
01:00 AM - 02:00 AM	62.4	83.1	61.1
02:00 AM - 03:00 AM	62.5	83.1	60.9
03:00 AM - 04:00 AM	63.0	85.4	61.3
04:00 AM - 05:00 AM	62.9	82.6	61.3
05:00 AM - 06:00 AM	65.4	82.4	64.3
06:00 AM - 07:00 AM	66.2	86.7	64.9
07:00 AM - 08:00 AM	66.3	87.1	64.8
08:00 AM - 09:00 AM	65.7	81.5	64.5
09:00 AM - 10:00 AM	66.1	87.9	64.4
10:00 AM - 11:00 AM	65.8	81.8	64.4
11:00 AM - 12:00 PM	65.5	88.9	63.9
12:00 PM - 01:00 PM	64.7	80.6	63.6

Leq Average 24 hrs. (dB(A)) 65.3  
Lmax (dB(A)) 91.6  
L90 (dB(A)) 64.0  
Ldn (dB(A)) 70.5  
Standard (dB(A)) 70 115

Reference Method : ISO1996-1 and 1996-2

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

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

Technical Management

Chontichak

Chonticha Subongkoch  
Scientist (3)

Approved by

Supot S

Supot Salamteh  
Section Head

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คุณภาพน้ำทิ้ง



## Analysis / Test Report

**Client** : Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O** : PO241210284  
**Project Name** : Monitoring  
**Project Location** :



**TESTING**  
**Nn 0042**  
**Lot ID: 24142445**  
Date Received : Jan 06, 2025  
Date Reported : Jan 13, 2025  
Report Number : 3197426-1

Page 1 of 2

**Sample Number** : 24142445-1  
**Sampled Date** : Jan 06, 2025 2:16 PM  
**Sample Description** : Wastewater  
**Location** : Effluent  
**Date Analysis Commenced** : Jan 06, 2025  
**Condition of Sample** : Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	7.2	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	44	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	16	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	14	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C		-	-	7.2	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	168	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	9	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

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

**Sampling By** : Wasan Kinunti ทะเบียนเลขที่ ว-323-ก-0019

**Remark** :

Technical Management

**Photchana S.**

Photchana Seeda  
Scientist (4)  
ทะเบียนเลขที่ ว-323-ก-0028

Approved by

**D. Chamon.**

Dej Changchon  
Senior Manager  
ทะเบียนเลขที่ ว-323-ก-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory.  
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## Analysis / Test Report

**Client** : Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O** : PO241210284  
**Project Name** : Monitoring  
**Project Location** :



**TESTING**  
**Nn 0042**  
**Lot ID: 24142445**  
Date Received : Jan 06, 2025  
Date Reported : Jan 13, 2025  
Report Number : 3197426-1

Page 2 of 2

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

Technical Management

**Photchana S.**

Photchana Seeda  
Scientist (4)  
ทะเบียนเลขที่ ว-323-ก-0028

Approved by

**D. Chamon.**

Dej Changchon  
Senior Manager  
ทะเบียนเลขที่ ว-323-ก-0001

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## Analysis / Test Report

**Client** : Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O** : PO241210284  
**Project Name** : Monitoring  
**Project Location** :



**TESTING**  
**№ 0042**  
**Lot ID: 255425**  
Date Received : Feb 06, 2025  
Date Reported : Feb 13, 2025  
Report Number : 3215489-1

Page 1 of 2

**Sample Number** : 255425-1  
**Sampled Date** : Feb 06, 2025 10:50 AM  
**Sample Description** : Wastewater  
**Location** : Effluent  
**Date Analysis Commenced** : Feb 06, 2025  
**Condition of Sample** : Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	133	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	309	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	178	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	175	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	6	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C		-	-	7.5	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	272	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	73	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

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

**Sampling By** : Warunyoo Chimphalee ทะเบียนเลขที่ ว-323-ก-0020

Remark :

Technical Management

**Photchana S.**

Photchana Seeda  
Scientist (4)  
ทะเบียนเลขที่ ว-323-ก-0028

Approved by

**D. Chamon.**

Dej Changchon  
Senior Manager  
ทะเบียนเลขที่ ว-323-ก-0001

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## Analysis / Test Report

**Client** : Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O** : PO241210284  
**Project Name** : Monitoring  
**Project Location** :



**TESTING**  
**№ 0042**  
**Lot ID: 255425**  
Date Received : Feb 06, 2025  
Date Reported : Feb 13, 2025  
Report Number : 3215489-1

Page 2 of 2

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.

Technical Management

**Photchana S.**

Photchana Seeda  
Scientist (4)  
ทะเบียนเลขที่ ว-323-ก-0028

Approved by

**D. Chamon.**

Dej Changchon  
Senior Manager  
ทะเบียนเลขที่ ว-323-ก-0001

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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241210284  
**Project Name :** Monitoring  
**Project Location :**



**TESTING**  
**№ 0042**  
**Lot ID: 2512785**  
Date Received : Mar 10, 2025  
Date Reported : Mar 17, 2025  
Report Number : 3230690-1

Page 1 of 2

**Sample Number** 2512785-1  
**Sampled Date** Mar 10, 2025 3:05 PM  
**Sample Description** Wastewater  
**Location** Effluent  
**Date Analysis Commenced** Mar 10, 2025  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)  
**Physical Property** Yellow, a lot of odour, some solid and a lot of turbid

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	132	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	235	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	84	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	82	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	6	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C		-	-	7.9	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	248	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	82	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

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

Technical Management

**Photchana S.**

Photchana Seeda  
Scientist (4)  
ทะเบียนเลขที่ ว-323-จ-0028

Approved by

**D. Chamon.**

Dej Changchon  
Senior Manager  
ทะเบียนเลขที่ ว-323-ก-0001

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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241210284  
**Project Name :** Monitoring  
**Project Location :**



**TESTING**  
**№ 0042**  
**Lot ID: 2512785**  
Date Received : Mar 10, 2025  
Date Reported : Mar 17, 2025  
Report Number : 3230690-1

Page 2 of 2

**Sampling By :** Warunyoo Chimphalee ทะเบียนเลขที่ ว-323-จ-0020

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

**Photchana S.**

Photchana Seeda  
Scientist (4)  
ทะเบียนเลขที่ ว-323-จ-0028

Approved by

**D. Chamon.**

Dej Changchon  
Senior Manager  
ทะเบียนเลขที่ ว-323-ก-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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## Analysis / Test Report

**Client** : Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O** : PO241210284  
**Project Name** : Monitoring  
**Project Location** :

**TESTING**  
No 0042  
**Lot ID: 2522922**  
Date Received : Apr 09, 2025  
Date Reported : Apr 19, 2025  
Report Number : 3253568-1

Page 1 of 2

**Sample Number** : 2522922-1  
**Sampled Date** : Apr 09, 2025 11:20 AM  
**Sample Description** : Wastewater  
**Location** : Effluent  
**Date Analysis Commenced** : Apr 09, 2025  
**Condition of Sample** : Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	178	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	403	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	135	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	133	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	13	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C		-	-	7.6	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	340	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	72	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

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

**Sampling By** : Surawit Narapong ทะเบียนเลขที่ ร-323-จ-0011

Remark :

Technical Management

**Photchana S.**

Photchana Seeda  
Scientist (4)  
ทะเบียนเลขที่ ร-323-จ-0028

Approved by

**D. Chamon.**

Dej Changchon  
Senior Manager  
ทะเบียนเลขที่ ร-323-ก-0001

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## Analysis / Test Report

**Client** : Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O** : PO241210284  
**Project Name** : Monitoring  
**Project Location** :

**TESTING**  
No 0042  
**Lot ID: 2522922**  
Date Received : Apr 09, 2025  
Date Reported : Apr 19, 2025  
Report Number : 3253568-1

Page 2 of 2

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

**Photchana S.**

Photchana Seeda  
Scientist (4)  
ทะเบียนเลขที่ ร-323-จ-0028

Approved by

**D. Chamon.**

Dej Changchon  
Senior Manager  
ทะเบียนเลขที่ ร-323-ก-0001

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## Analysis / Test Report

**Client** : Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O** : PO241210284  
**Project Name** : Monitoring  
**Project Location** :

**TESTING**  
**Nn 0042**  
**Lot ID: 2531902**  
Date Received : May 13, 2025  
Date Reported : May 20, 2025  
Report Number : 3273573-1

Page 1 of 2

<b>Sample Number</b>	2531902-1						
<b>Sampled Date</b>	May 13, 2025 3:30 PM						
<b>Sample Description</b>	Wastewater						
<b>Location</b>	Effluent						
<b>Date Analysis Commenced</b>	May 13, 2025						
<b>Condition of Sample</b>	Contained in one glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	98.4	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	258	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	119	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	119	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	8	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C		-	-	7.6	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	296	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	51	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

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

**Sampling By** : Amonwich Wongsachai ทะเบียนเลขที่ ว-323-จ-0040

Remark :

Technical Management

**Photchana S.**

Photchana Seeda  
Scientist (4)  
ทะเบียนเลขที่ ว-323-จ-0028

Approved by

**D. Chamon.**

Dej Changchon  
Senior Manager  
ทะเบียนเลขที่ ว-323-ก-0001

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## Analysis / Test Report

**Client** : Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O** : PO241210284  
**Project Name** : Monitoring  
**Project Location** :

**TESTING**  
**Nn 0042**  
**Lot ID: 2531902**  
Date Received : May 13, 2025  
Date Reported : May 20, 2025  
Report Number : 3273573-1

Page 2 of 2

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

**Photchana S.**

Photchana Seeda  
Scientist (4)  
ทะเบียนเลขที่ ว-323-จ-0028

Approved by

**D. Chamon.**

Dej Changchon  
Senior Manager  
ทะเบียนเลขที่ ว-323-ก-0001

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## Analysis / Test Report

**Client** : Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O** : PO241210284  
**Project Name** : Monitoring  
**Project Location** :

**TESTING**  
**Nn 0042**  
**Lot ID: 2545597**  
Date Received : Jun 09, 2025  
Date Reported : Jun 16, 2025  
Report Number : 3306260-1

Page 1 of 2

**Sample Number** : 2545597-1  
**Sampled Date** : Jun 09, 2025 10:40 AM  
**Sample Description** : Wastewater  
**Location** : Effluent  
**Date Analysis Commenced** : Jun 09, 2025  
**Condition of Sample** : Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	26.5	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	131	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Rayong
Color (at Original pH)	ADMI	-	5	47	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	46	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C		-	-	7.7	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	192	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	26	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

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

**Sampling By** : Wasan Kinunti ทะเบียนเลขที่ ว-323-จ-0019

Remark :

Technical Management

**Photchana S.**

Photchana Seeda

Scientist (4)

ทะเบียนเลขที่ ว-323-จ-0028

Approved by

**D. Chamon.**

Dej Changchon

Senior Manager

ทะเบียนเลขที่ ว-323-ก-0001

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## Analysis / Test Report

**Client** : Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O** : PO241210284  
**Project Name** : Monitoring  
**Project Location** :

**TESTING**  
**Nn 0042**  
**Lot ID: 2545597**  
Date Received : Jun 09, 2025  
Date Reported : Jun 16, 2025  
Report Number : 3306260-1

Page 2 of 2

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

**Photchana S.**

Photchana Seeda

Scientist (4)

ทะเบียนเลขที่ ว-323-จ-0028

Approved by

**D. Chamon.**

Dej Changchon

Senior Manager

ทะเบียนเลขที่ ว-323-ก-0001

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# ภาคผนวก ค-5

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ระดับความร้อนในสถานที่ทำงาน





## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

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

**Lot ID: 2513169**  
Date Received : Feb 19, 2025  
Date Reported : Feb 24, 2025  
Report Number: 3231925-1

Page 1 of 4

**Sample Number** 2513169-1  
**Parameter** Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)  
**Measurement Date** Feb 18, 2025  
**Measurement by** Chanon Booncheun  
**Location** ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
พื้นที่เดาหลอม รง.1 (H3)	120	30.5	29.4	32.9	32.8
Average (WBGT)		30.5			
Guideline WBGT (°C)		32.0			

**Reference Method :** Wet Bulb Globe Temperature

### Guideline:

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

Technical Management

*Supot S.*  
Supot Salamteh  
Section Head

Approved by

*Wichan Choonharat*  
Wichan Choonharat  
Assistant Manager

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300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

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

**Lot ID: 2513169**  
Date Received : Feb 19, 2025  
Date Reported : Feb 24, 2025  
Report Number: 3231925-1

Page 2 of 4

**Sample Number** 2513169-2  
**Parameter** Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)  
**Measurement Date** Feb 18, 2025  
**Measurement by** Chanon Booncheun  
**Location** ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
พื้นที่เดาหลอม รง.2 (H4)	120	29.5	28.3	32.2	31.9
Average (WBGT)		29.5			
Guideline WBGT (°C)		32.0			

**Reference Method :** Wet Bulb Globe Temperature

### Guideline:

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

Technical Management

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Supot Salamteh  
Section Head

Approved by

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

**Lot ID: 2513169**  
Date Received : Feb 19, 2025  
Date Reported : Feb 24, 2025  
Report Number: 3231925-1

Page 3 of 4

**Sample Number** 2513169-3  
**Parameter** Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)  
**Measurement Date** Feb 18, 2025  
**Measurement by** Chanon Booncheun  
**Location** ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
พื้นที่ทำโสมบ Shell Core รง.1 (H1)	120	31.8	29.9	36.2	35.9
Average (WBGT)		31.8			
Guideline WBGT (°C)		32.0			

**Reference Method :** Wet Bulb Globe Temperature

### Guideline:

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

Technical Management

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Supot Salamteh  
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**P/O :**  
**Project Name :** Monitoring  
**Project Location :**

**Lot ID: 2513169**  
Date Received : Feb 19, 2025  
Date Reported : Feb 24, 2025  
Report Number: 3231925-1

Page 4 of 4

**Sample Number** 2513169-4  
**Parameter** Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)  
**Measurement Date** Feb 18, 2025  
**Measurement by** Chanon Booncheun  
**Location** ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
พื้นที่ทำโสมบ Shell Core รง.2 (H2)	120	30.6	29.4	33.4	33.3
Average (WBGT)		30.6			
Guideline WBGT (°C)		32.0			

**Reference Method :** Wet Bulb Globe Temperature

### Guideline:

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

Technical Management

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Supot Salamteh  
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Approved by

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Wichan Choonharat  
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## Analysis / Test Report

Client : Kiriu (Thailand) Co., Ltd.

300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

P/O : PO241110529

Project Name : Monitoring

Project Location :

Lot ID: 2542355

Date Received : May 14, 2025

Date Reported : May 19, 2025

Report Number: 3298768-1

Page 1 of 4

Sample Number 2542355-1  
Parameter Heat Stress (Sampling Time : 01.00 PM - 03.00 PM)  
Measurement Date May 13, 2025  
Measurement by Supot Salamteh  
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
พื้นที่เดาหลอม รง.1 (H3)	120	28.6	26.7	32.9	32.6
Average (WBGT)		28.6			
Guideline WBGT (°C)		32.0			

Reference Method : Wet Bulb Globe Temperature

### Guideline:

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

Technical Management

Supot Salamteh  
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## Analysis / Test Report

Client : Kiriu (Thailand) Co., Ltd.

300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

P/O : PO241110529

Project Name : Monitoring

Project Location :

Lot ID: 2542355

Date Received : May 14, 2025

Date Reported : May 19, 2025

Report Number: 3298768-1

Page 2 of 4

Sample Number 2542355-2  
Parameter Heat Stress (Sampling Time : 01.00 PM - 03.00 PM)  
Measurement Date May 13, 2025  
Measurement by Supot Salamteh  
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
พื้นที่เดาหลอม รง.2 (H4)	120	29.5	27.2	34.8	34.0
Average (WBGT)		29.5			
Guideline WBGT (°C)		32.0			

Reference Method : Wet Bulb Globe Temperature

### Guideline:

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

Technical Management

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## Analysis / Test Report

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300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**

**Lot ID: 2542355**  
Date Received : May 14, 2025  
Date Reported : May 19, 2025  
Report Number: 3298768-1

Page 3 of 4

**Sample Number** 2542355-3  
**Parameter** Heat Stress (Sampling Time : 01.00 PM - 03.00 PM)  
**Measurement Date** May 13, 2025  
**Measurement by** Supot Salamteh  
**Location** ปฏิบัติงาน 1 พื้นที่ (ข้อ-นามสกุล ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
พื้นที่ทำสนาม Shell Core รง.1 (H1)	120	29.6	27.1	35.4	34.9
Average (WBGT)		29.6			
Guideline WBGT (°C)		32.0			

**Reference Method :** Wet Bulb Globe Temperature

### Guideline:

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

*Supot S.*  
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## Analysis / Test Report

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300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**

**Lot ID: 2542355**  
Date Received : May 14, 2025  
Date Reported : May 19, 2025  
Report Number: 3298768-1

Page 4 of 4

**Sample Number** 2542355-4  
**Parameter** Heat Stress (Sampling Time : 01.00 PM - 03.00 PM)  
**Measurement Date** May 13, 2025  
**Measurement by** Supot Salamteh  
**Location** ปฏิบัติงาน 1 พื้นที่ (ข้อ-นามสกุล ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
พื้นที่ทำสนาม Shell Core รง.2 (H2)	120	29.7	27.1	35.6	35.1
Average (WBGT)		29.7			
Guideline WBGT (°C)		32.0			

**Reference Method :** Wet Bulb Globe Temperature

### Guideline:

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

Technical Management

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Supot Salamteh  
Section Head

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3 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260  
Tel.0 2763 2828 Fax 0 2763 2800 www.uaec consultant.com E-mail: uae@uaec consultant.com

## ANALYSIS REPORT

**CUSTOMER NAME** : KIRIU (THAILAND) CO.,LTD  
**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เตาหลอมโรงงาน 1 (D1)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 08:30-12:30 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016211  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เตาหลอมโรงงาน 1 (D1) T25AD584-0001
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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## ANALYSIS REPORT

**CUSTOMER NAME** : KIRIU (THAILAND) CO.,LTD  
**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เตาหลอมโรงงาน 1 (D1)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 08:31-12:31 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016212  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เตาหลอมโรงงาน 1 (D1) (คุณเจษฎา วรรณภา) T25AD584-0002
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เล้าหลอมโรงงาน 2 (D2)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 08:37-12:37 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016213  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เล้าหลอมโรงงาน 2 (D2) T25AD584-0003
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เล้าหลอมโรงงาน 2 (D2)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 08:38-12:38 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016214  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0004

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เล้าหลอมโรงงาน 2 (D2) (คุณเบญจศักดิ์ วิเศษบุญ) T25AD584-0004
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เตรียมแบบทรายโรงงาน 1 (D5)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 08:34-12:34 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016215  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0005

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เตรียมแบบทรายโรงงาน 1 (D5) T25AD584-0005
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เตรียมแบบทรายโรงงาน 1 (D5)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 08:35-12:35 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016216  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0006

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เตรียมแบบทรายโรงงาน 1 (D5) (จุดประหลี่ ทองสุกใส) T25AD584-0006
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เตรียมแบบทรายโรงงาน 2 (D6)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 08:40-12:40 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016217  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0007

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เตรียมแบบทรายโรงงาน 2 (D6) T25AD584-0007
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เตรียมแบบทรายโรงงาน 2 (D6)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 08:41-12:41 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016218  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0008

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เตรียมแบบทรายโรงงาน 2 (D6) (คุณวันชัย วงศ์เศศ) T25AD584-0008
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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## ANALYSIS REPORT

**CUSTOMER NAME** : KIRIU (THAILAND) CO.,LTD  
**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เคาะแบบชิ้นงานโรงงาน 1 (D3)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 13:30-17:30 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT  
**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016219  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0009

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เคาะแบบชิ้นงานโรงงาน 1 (D3) T25AD584-0009
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เคาะแบบชิ้นงานโรงงาน 1 (D3)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 13:31-17:31 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT  
**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016220  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0010

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เคาะแบบชิ้นงานโรงงาน 1 (D3) (จุดเคาะวัด ณ จันทรา) T25AD584-0010
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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ADDRESS : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
CONTACT INFORMATION : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
SAMPLING SOURCE : พื้นที่เคาะแบบขี้นงานโรงงาน 2 (D4)  
SAMPLE TYPE : WORKPLACE  
SAMPLING DATE : FEBRUARY 19, 2025  
SAMPLING TIME : 08:43-12:43 HOUR  
SAMPLING BY : MR BOONYARIT KONSIN  
ANALYZED BY : MISS JETJARIN TUMSA-AT  
RECEIVED DATE : FEBRUARY 20, 2025  
ANALYTICAL DATE : FEBRUARY 20-25, 2025  
ISSUE DATE : FEBRUARY 26, 2025  
REPORT NO. : 2025-U016221  
WORK NO. : 2024-011282  
ANALYSIS NO. : T25AD584-0011

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เคาะแบบขี้นงานโรงงาน 2 (D4) T25AD584-0011
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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ADDRESS : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
CONTACT INFORMATION : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
SAMPLING SOURCE : พื้นที่เคาะแบบขี้นงานโรงงาน 2 (D4)  
SAMPLE TYPE : WORKPLACE  
SAMPLING DATE : FEBRUARY 19, 2025  
SAMPLING TIME : 08:44-12:44 HOUR  
SAMPLING BY : MR BOONYARIT KONSIN  
ANALYZED BY : MISS JETJARIN TUMSA-AT  
RECEIVED DATE : FEBRUARY 20, 2025  
ANALYTICAL DATE : FEBRUARY 20-25, 2025  
ISSUE DATE : FEBRUARY 26, 2025  
REPORT NO. : 2025-U016222  
WORK NO. : 2024-011282  
ANALYSIS NO. : T25AD584-0012

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เคาะแบบขี้นงานโรงงาน 2 (D4) (ตุณวิทยา ดอนศรี) T25AD584-0012
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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### ANALYSIS REPORT

**CUSTOMER NAME** : KIRIU (THAILAND) CO.,LTD  
**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่บริเวณ GRINDING (D7) (BARINDER)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 13:33-17:33 HOUR  
**SAMPLING BY** : MR. BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016223  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0013

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ GRINDING (D7) (BARINDER) T25AD584-0013
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่บริเวณ GRINDING (D7) (BARINDER)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 13:34-17:34 HOUR  
**SAMPLING BY** : MR. BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016224  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0014

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ GRINDING (D7) (BARINDER) (คุณสุวิทย์ มั่นนาคะ) T25AD584-0014
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่บริเวณ DRUMBLAST NO.1 (D8)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 13:36-17:36 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016225  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0015

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ DRUMBLAST NO.1 (D8) T25AD584-0015
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่บริเวณ DRUMBLAST NO.1 (D8)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 13:37-17:37 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016226  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0016

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ DRUMBLAST NO.1 (D8) (คุณเกรียงไกร หล้าป้อม) T25AD584-0016
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่บริเวณ SHOT BLAST NO.1&2 (D9)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 13:39-17:39 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016227  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0017

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ SHOT BLAST NO.1&2 (D9) T25AD584-0017
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่บริเวณ SHOT BLAST NO.1&2 (D9)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 13:40-17:40 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016228  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0018

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ SHOT BLAST NO.1&2 (D9) (ชุดวิธี กายสิทธิ์) T25AD584-0018
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**CUSTOMER NAME** : KIRIU (THAILAND) CO.,LTD  
**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่บริเวณ APRON FINSHING 1 (D10)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 13:42-17:42 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016229  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0019

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ APRON FINSHING 1 (D10) T25AD584-0019
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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### ANALYSIS REPORT

**CUSTOMER NAME** : KIRIU (THAILAND) CO.,LTD  
**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่บริเวณ APRON FINSHING 1 (D10)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 13:43-17:43 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016230  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0020

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ APRON FINSHING 1 (D10) (จุดสุ่มกร บัณธมณ) T25AD584-0020
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่บริเวณ APRON FINSHING 2 (D11)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 08:46-12:46 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016231  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0021

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ APRON FINSHING 2 (D11) T25AD584-0021
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่บริเวณ APRON FINSHING 2 (D11)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : FEBRUARY 19, 2025  
**SAMPLING TIME** : 08:47-12:47 HOUR  
**SAMPLING BY** : MR BOONYARIT KONSIN  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : FEBRUARY 20, 2025  
**ANALYTICAL DATE** : FEBRUARY 20-25, 2025  
**ISSUE DATE** : FEBRUARY 26, 2025  
**REPORT NO.** : 2025-U016232  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AD584-0022

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ APRON FINSHING 2 (D11) (คุณพิชัย พงษ์) T25AD584-0022
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เตาหลอมโรงงาน 1 (D1)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 08:55-12:55 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053401  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เตาหลอมโรงงาน 1 (D1) T25AM352-0001
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK

RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.



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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เตาหลอมโรงงาน 1 (D1)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 08:56-12:56 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053402  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เตาหลอมโรงงาน 1 (D1) (คุณบรรณพ แชนซ็อน) T25AM352-0002
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK

RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**CUSTOMER NAME** : KIRIU (THAILAND) CO.,LTD  
**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่อาคารโรงงาน 2 (D2)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 08:50-12:50 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053403  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่อาคารโรงงาน 2 (D2) T25AM352-0003
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่อาคารโรงงาน 2 (D2)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 08:51-12:51 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053404  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0004

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่อาคารโรงงาน 2 (D2) (จุดเก็บผล ทงศลดทว) T25AM352-0004
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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CONTACT INFORMATION : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
SAMPLING SOURCE : พื้นที่เตรียมแบบทราจโรงงาน 1 (D5)  
SAMPLE TYPE : WORKPLACE  
SAMPLING DATE : JUNE 6, 2025  
SAMPLING TIME : 09:00-13:00 HOUR  
SAMPLING BY : MR SURACHOKE LARTHO  
ANALYZED BY : MISS JETJARIN TUMSA-AT  
RECEIVED DATE : JUNE 7, 2025  
ANALYTICAL DATE : JUNE 7-11, 2025  
ISSUE DATE : JUNE 17, 2025  
REPORT NO. : 2025-U053405  
WORK NO. : 2024-011282  
ANALYSIS NO. : T25AM352-0005

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เตรียมแบบทราจโรงงาน 1 (D5) T25AM352-0005
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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CONTACT INFORMATION : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
SAMPLING SOURCE : พื้นที่เตรียมแบบทราจโรงงาน 1 (D5)  
SAMPLE TYPE : WORKPLACE  
SAMPLING DATE : JUNE 6, 2025  
SAMPLING TIME : 09:01-13:01 HOUR  
SAMPLING BY : MR SURACHOKE LARTHO  
ANALYZED BY : MISS JETJARIN TUMSA-AT  
RECEIVED DATE : JUNE 7, 2025  
ANALYTICAL DATE : JUNE 7-11, 2025  
ISSUE DATE : JUNE 17, 2025  
REPORT NO. : 2025-U053406  
WORK NO. : 2024-011282  
ANALYSIS NO. : T25AM352-0006

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เตรียมแบบทราจโรงงาน 1 (D5) (คุณรัตพล เดิมบาง) T25AM352-0006
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เตรียมแบบทรายโรงงาน 2 (D6)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 08:45-12:45 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053407  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0007

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เตรียมแบบทรายโรงงาน 2 (D6) T25AM352-0007
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เตรียมแบบทรายโรงงาน 2 (D6)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 08:46-12:46 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053408  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0008

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เตรียมแบบทรายโรงงาน 2 (D6) (ลดเล็ดลอด ฝักรรณ) T25AM352-0008
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เคาะแบบขี้นงานโรงงาน 1 (D3)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 13:25-17:25 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053409  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0009

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เคาะแบบขี้นงานโรงงาน 1 (D3) T25AM352-0009
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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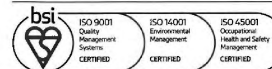
**CUSTOMER NAME** : KIRIU (THAILAND) CO.,LTD  
**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เคาะแบบขี้นงานโรงงาน 1 (D3)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 13:26-17:26 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053410  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0010

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เคาะแบบขี้นงานโรงงาน 1 (D3) (คุณวีระยุทธ แสนกุล) T25AM352-0010
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เคาะแบบชิ้นงานโรงงาน 2 (D4)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 08:40-12:40 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTH0  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053411  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0011

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เคาะแบบชิ้นงานโรงงาน 2 (D4) T25AM352-0011
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่เคาะแบบชิ้นงานโรงงาน 2 (D4)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 08:41-12:41 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTH0  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053412  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0012

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่เคาะแบบชิ้นงานโรงงาน 2 (D4) (คุณพิชัย พลชัย) T25AM352-0012
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นพื้นบริเวณ GRINDING (D7) (BARINDER)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 13:22-17:22 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTH0  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053413  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0013

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นพื้นบริเวณ GRINDING (D7) (BARINDER) T25AM352-0013
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK

RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นพื้นบริเวณ GRINDING (D7) (BARINDER)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 13:23-17:23 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTH0  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053414  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0014

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นพื้นบริเวณ GRINDING (D7) (BARINDER) (คุณสมเจ็ด สิงห์วงค์มา) T25AM352-0014
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK

RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**CUSTOMER NAME** : KIRIU (THAILAND) CO.,LTD  
**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นพื้นที่บริเวณ DRUMBLAST NO.1 (D8)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 13:13-17:13 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053415  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0015

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ DRUMBLAST NO.1 (D8) T25AM352-0015
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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Tel.0 2763 2828 Fax 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com

### ANALYSIS REPORT

**CUSTOMER NAME** : KIRIU (THAILAND) CO.,LTD  
**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นพื้นที่บริเวณ DRUMBLAST NO.1 (D8)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 13:14-17:14 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053416  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0016

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ DRUMBLAST NO.1 (D8) (คุณสมบัติประจำองค์กร ไร่กลาง) T25AM352-0016
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**CUSTOMER NAME** : KIRIU (THAILAND) CO.,LTD  
**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่บริเวณ SHOT BLAST NO.1&2 (D9)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 13:18-17:18 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT  
**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053417  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0017

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ SHOT BLAST NO.1&2 (D9) T25AM352-0017
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK

RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่บริเวณ SHOT BLAST NO.1&2 (D9)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 13:19-17:19 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT  
**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053420  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0018

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ SHOT BLAST NO.1&2 (D9) (จุดวัดทิศใต้ งาม) T25AM352-0018
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK

RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่บริเวณ APRON FINISHING 1 (D10)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 13:08-17:08 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053423  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0019

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ APRON FINISHING 1 (D10) T25AM352-0019
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK

RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นที่บริเวณ APRON FINISHING 1 (D10)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 13:09-17:09 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053426  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0020

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นที่บริเวณ APRON FINISHING 1 (D10) (ชุดอนุวรณ์ จันทรา) T25AM352-0020
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK

RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นพื้นบริเวณ APRON FINISHING 2 (D11)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 08:43-12:43 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053431  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0021

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นพื้นบริเวณ APRON FINISHING 2 (D11) T25AM352-0021
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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**CUSTOMER NAME** : KIRIU (THAILAND) CO.,LTD  
**ADDRESS** : 300/37 TA SIT PLUAK DAENG RAYONG 21140  
**CONTACT INFORMATION** : TEL : 08 5024 0558 e-mail : k-supapan@kiriuthailand.com  
**SAMPLING SOURCE** : พื้นพื้นบริเวณ APRON FINISHING 2 (D11)  
**SAMPLE TYPE** : WORKPLACE  
**SAMPLING DATE** : JUNE 6, 2025  
**SAMPLING TIME** : 08:44-12:44 HOUR  
**SAMPLING BY** : MR SURACHOKE LARTHO  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : JUNE 7, 2025  
**ANALYTICAL DATE** : JUNE 7-11, 2025  
**ISSUE DATE** : JUNE 17, 2025  
**REPORT NO.** : 2025-U053433  
**WORK NO.** : 2024-011282  
**ANALYSIS NO.** : T25AM352-0022

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			พื้นพื้นบริเวณ APRON FINISHING 2 (D11) (ชุดจักรพื้นรถ การกลิ้ง) T25AM352-0022
SILICA (QUARTZ)	mg/m <sup>3</sup>	VISIBLE ABSORPTION SPECTROPHOTOMETRIC METHOD (NIOSH METHOD 7601)	< 0.01
SAMPLE CONDITION			COMPLETE

REMARK  
RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

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

**Lot ID: 2513168**  
Date Received : Feb 19, 2025  
Date Reported : Feb 24, 2025  
Report Number: 3241699-1

Page 1 of 1

**Sample Number** 2513168-1  
**Parameter** Noise (Leq 8 hrs.)  
**Location** พื้นที่เดาหลอม รง.1 (N3)  
**Measurement Date** Feb 18, 2025  
**Measurement by** Chanon Booncheun

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	87.5	109.2	78.1
10:00 AM - 11:00 AM	86.9	107.8	78.7
11:00 AM - 12:00 PM	84.8	106.8	76.6
12:00 PM - 01:00 PM	88.0	108.8	79.2
01:00 PM - 02:00 PM	87.8	108.8	78.2
02:00 PM - 03:00 PM	83.7	102.9	75.9
03:00 PM - 04:00 PM	88.2	109.5	78.0
04:00 PM - 05:00 PM	85.0	107.0	76.8

Leq Average 8 hrs. (dB(A)) 86.8  
Lmax (dB(A)) 109.5  
Standard (dB(A)) 90 140  
Reference Method : ISO1996-1 and 1996-2  
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย  
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Technical Management

Chontichak

Chonticha Subongkoch  
Scientist (3)

Approved by

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Supot Salamteh  
Section Head

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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

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

**Lot ID: 2513168**  
Date Received : Feb 19, 2025  
Date Reported : Feb 24, 2025  
Report Number: 3241700-1

Page 1 of 1

**Sample Number** 2513168-2  
**Parameter** Noise (Leq 8 hrs.)  
**Location** พื้นที่เดาหลอม รง.2 (N4)  
**Measurement Date** Feb 18, 2025  
**Measurement by** Chanon Booncheun

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	89.0	102.4	84.1
10:00 AM - 11:00 AM	88.2	103.8	84.6
11:00 AM - 12:00 PM	89.7	101.5	85.1
12:00 PM - 01:00 PM	88.1	101.0	82.9
01:00 PM - 02:00 PM	88.5	104.2	83.6
02:00 PM - 03:00 PM	89.4	103.1	84.1
03:00 PM - 04:00 PM	85.7	101.3	82.1
04:00 PM - 05:00 PM	88.7	102.1	83.8

Leq Average 8 hrs. (dB(A)) 88.5  
Lmax (dB(A)) 104.2  
Standard (dB(A)) 90 140  
Reference Method : ISO1996-1 and 1996-2  
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย  
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Chonticha Subongkoch  
Scientist (3)

Approved by

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## Analysis / Test Report

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300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

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

**Lot ID: 2513168**  
Date Received : Feb 19, 2025  
Date Reported : Feb 24, 2025  
Report Number: 3241701-1

Page 1 of 1

**Sample Number** 2513168-3  
**Parameter** Noise (Leq 8 hrs.)  
**Location** พื้นที่ผสมทราย รง.1 (N1)  
**Measurement Date** Feb 18, 2025  
**Measurement by** Chanon Booncheun

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	84.7	89.6	82.6
10:00 AM - 11:00 AM	83.0	90.0	79.9
11:00 AM - 12:00 PM	84.5	91.6	82.3
12:00 PM - 01:00 PM	84.8	90.9	82.4
01:00 PM - 02:00 PM	84.1	89.8	80.8
02:00 PM - 03:00 PM	84.3	90.5	81.8
03:00 PM - 04:00 PM	84.6	94.3	81.2
04:00 PM - 05:00 PM	84.5	93.5	80.0

Leq Average 8 hrs. (dB(A)) 84.3  
Lmax (dB(A)) 94.3  
Standard (dB(A)) 90  
Reference Method : ISO1996-1 and 1996-2  
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย  
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## Analysis / Test Report

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300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

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

**Lot ID: 2513168**  
Date Received : Feb 19, 2025  
Date Reported : Feb 24, 2025  
Report Number: 3241702-1

Page 1 of 1

**Sample Number** 2513168-4  
**Parameter** Noise (Leq 8 hrs.)  
**Location** พื้นที่ผสมทราย รง.2 (N2)  
**Measurement Date** Feb 18, 2025  
**Measurement by** Chanon Booncheun

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	84.4	94.4	82.8
10:00 AM - 11:00 AM	84.1	93.1	82.2
11:00 AM - 12:00 PM	83.9	94.1	82.3
12:00 PM - 01:00 PM	84.2	92.8	82.4
01:00 PM - 02:00 PM	84.6	94.2	82.9
02:00 PM - 03:00 PM	84.2	92.7	82.6
03:00 PM - 04:00 PM	84.4	95.3	82.3
04:00 PM - 05:00 PM	84.1	94.3	82.5

Leq Average 8 hrs. (dB(A)) 84.2  
Lmax (dB(A)) 95.3  
Standard (dB(A)) 90  
Reference Method : ISO1996-1 and 1996-2  
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย  
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Chonticha Subongkoch  
Scientist (3)

Approved by

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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

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

**Lot ID: 2513168**  
Date Received : Feb 19, 2025  
Date Reported : Feb 24, 2025  
Report Number: 3241703-1

Page 1 of 1

**Sample Number** 2513168-5  
**Parameter** Noise (Leq 8 hrs.)  
**Location** พื้นที่เคาะแบบขึงงาน รง.1 (N5)  
**Measurement Date** Feb 18, 2025  
**Measurement by** Chanon Booncheun

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	89.1	102.5	76.8
10:00 AM - 11:00 AM	89.4	99.9	85.2
11:00 AM - 12:00 PM	87.4	101.8	83.9
12:00 PM - 01:00 PM	88.4	98.8	87.3
01:00 PM - 02:00 PM	89.7	103.2	88.1
02:00 PM - 03:00 PM	89.1	101.0	81.9
03:00 PM - 04:00 PM	89.1	99.6	85.9
04:00 PM - 05:00 PM	89.6	100.1	85.4

Leq Average 8 hrs. (dB(A)) 89.0  
Lmax (dB(A)) 103.2  
Standard (dB(A)) 90 140  
Reference Method : ISO1996-1 and 1996-2  
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานคุ้มครองความปลอดภัย  
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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140

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

**Lot ID: 2513168**  
Date Received : Feb 19, 2025  
Date Reported : Feb 24, 2025  
Report Number: 3241704-1

Page 1 of 1

**Sample Number** 2513168-6  
**Parameter** Noise (Leq 8 hrs.)  
**Location** พื้นที่เคาะแบบขึงงาน รง.2 (N6)  
**Measurement Date** Feb 18, 2025  
**Measurement by** Chanon Booncheun

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	87.0	97.8	84.5
10:00 AM - 11:00 AM	86.3	98.2	83.7
11:00 AM - 12:00 PM	86.2	99.5	83.6
12:00 PM - 01:00 PM	86.3	99.9	84.2
01:00 PM - 02:00 PM	87.6	100.0	84.8
02:00 PM - 03:00 PM	87.1	98.7	84.7
03:00 PM - 04:00 PM	87.1	97.9	84.8
04:00 PM - 05:00 PM	87.2	98.0	84.7

Leq Average 8 hrs. (dB(A)) 86.9  
Lmax (dB(A)) 100.0  
Standard (dB(A)) 90 140  
Reference Method : ISO1996-1 and 1996-2  
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานคุ้มครองความปลอดภัย  
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## Analysis / Test Report

**Client :** Kiriu (Thailand) Co., Ltd.  
300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**

**Lot ID: 2542356**  
Date Received : May 14, 2025  
Date Reported : May 19, 2025  
Report Number: 3310021-1

Page 1 of 1

<b>Sample Number</b>	2542356-1		
<b>Parameter</b>	Noise (Leq 8 hrs.)		
<b>Location</b>	พื้นที่เดาหลอม รง.1 (N3)		
<b>Measurement Date</b>	May 13, 2025		
<b>Measurement by</b>	Supot Salamteh		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:05 AM - 10:05 AM	87.4	106.3	78.6
10:05 AM - 11:05 AM	88.8	108.2	76.9
11:05 AM - 12:05 PM	83.1	109.9	75.6
12:05 PM - 01:05 PM	84.5	102.9	77.7
01:05 PM - 02:05 PM	86.6	106.7	78.0
02:05 PM - 03:05 PM	85.8	106.3	76.0
03:05 PM - 04:05 PM	86.2	105.1	77.4
04:05 PM - 05:05 PM	86.7	106.8	78.1
Leq Average 8 hrs. (dB(A))	86.4		
Lmax (dB(A))		109.9	
Standard (dB(A))	90	140	
Reference Method : ISO1996-1 and 1996-2			
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๔๖			

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300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**

**Lot ID: 2542356**  
Date Received : May 14, 2025  
Date Reported : May 19, 2025  
Report Number: 3310022-1

Page 1 of 1

<b>Sample Number</b>	2542356-2		
<b>Parameter</b>	Noise (Leq 8 hrs.)		
<b>Location</b>	พื้นที่เดาหลอม รง.2 (N4)		
<b>Measurement Date</b>	May 13, 2025		
<b>Measurement by</b>	Supot Salamteh		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:12 AM - 10:12 AM	84.5	102.8	80.6
10:12 AM - 11:12 AM	87.9	105.9	82.1
11:12 AM - 12:12 PM	87.9	107.6	80.8
12:12 PM - 01:12 PM	87.0	102.7	80.9
01:12 PM - 02:12 PM	87.5	107.2	80.4
02:12 PM - 03:12 PM	87.4	103.1	81.3
03:12 PM - 04:12 PM	87.4	105.4	81.6
04:12 PM - 05:12 PM	87.3	103.0	81.2
Leq Average 8 hrs. (dB(A))	87.2		
Lmax (dB(A))		107.6	
Standard (dB(A))	90	140	
Reference Method : ISO1996-1 and 1996-2			
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๔๖			

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**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**

**Lot ID: 2542356**  
Date Received : May 14, 2025  
Date Reported : May 19, 2025  
Report Number: 3310023-1

Page 1 of 1

**Sample Number** 2542356-3  
**Parameter** Noise (Leq 8 hrs.)  
**Location** พื้นที่ผสมทราย รง.1 (N1)  
**Measurement Date** May 13, 2025  
**Measurement by** Supot Salamteh

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:09 AM - 10:09 AM	82.9	89.3	79.5
10:09 AM - 11:09 AM	83.1	90.0	80.9
11:09 AM - 12:09 PM	83.0	89.3	80.1
12:09 PM - 01:09 PM	82.5	87.3	80.3
01:09 PM - 02:09 PM	82.0	89.7	79.7
02:09 PM - 03:09 PM	82.2	89.8	80.1
03:09 PM - 04:09 PM	81.9	89.9	79.5
04:09 PM - 05:09 PM	82.8	89.7	80.6

Leq Average 8 hrs. (dB(A)) 82.6  
Lmax (dB(A)) 90.0  
Standard (dB(A)) 90  
Reference Method : ISO1996-1 and 1996-2  
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย  
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**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**

**Lot ID: 2542356**  
Date Received : May 14, 2025  
Date Reported : May 19, 2025  
Report Number: 3310024-1

Page 1 of 1

**Sample Number** 2542356-4  
**Parameter** Noise (Leq 8 hrs.)  
**Location** พื้นที่ผสมทราย รง.2 (N2)  
**Measurement Date** May 13, 2025  
**Measurement by** Supot Salamteh

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:19 AM - 10:19 AM	82.6	92.8	80.6
10:19 AM - 11:19 AM	83.4	93.0	81.9
11:19 AM - 12:19 PM	84.3	95.8	81.8
12:19 PM - 01:19 PM	83.9	92.4	82.3
01:19 PM - 02:19 PM	83.4	92.5	81.9
02:19 PM - 03:19 PM	84.0	91.9	82.7
03:19 PM - 04:19 PM	83.9	91.8	82.3
04:19 PM - 05:19 PM	83.8	93.4	82.3

Leq Average 8 hrs. (dB(A)) 83.7  
Lmax (dB(A)) 95.8  
Standard (dB(A)) 140  
Reference Method : ISO1996-1 and 1996-2  
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรฐานการคุ้มครองความปลอดภัย  
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**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**

**Lot ID: 2542356**  
Date Received : May 14, 2025  
Date Reported : May 19, 2025  
Report Number: 3310025-1

Page 1 of 1

**Sample Number** 2542356-5  
**Parameter** Noise (Leq 8 hrs.)  
**Location** พื้นที่เคาะแบบขึงงาน รง.1 (N5)  
**Measurement Date** May 13, 2025  
**Measurement by** Supot Salamteh

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:02 AM - 10:02 AM	89.6	104.7	87.7
10:02 AM - 11:02 AM	89.3	104.0	79.2
11:02 AM - 12:02 PM	84.2	96.5	79.4
12:02 PM - 01:02 PM	89.6	107.1	86.0
01:02 PM - 02:02 PM	89.9	101.3	88.5
02:02 PM - 03:02 PM	89.8	107.6	86.9
03:02 PM - 04:02 PM	89.8	108.4	79.3
04:02 PM - 05:02 PM	89.4	99.3	81.7

Leq Average 8 hrs. (dB(A)) 89.2  
Lmax (dB(A)) 108.4  
Standard (dB(A)) 90  
Reference Method : ISO1996-1 and 1996-2  
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย  
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300/37 Moo 1, T.Thasit, A.Pluakdaeng, Rayong Thailand 21140  
**P/O :** PO241110529  
**Project Name :** Monitoring  
**Project Location :**

**Lot ID: 2542356**  
Date Received : May 14, 2025  
Date Reported : May 19, 2025  
Report Number: 3310026-1

Page 1 of 1

**Sample Number** 2542356-6  
**Parameter** Noise (Leq 8 hrs.)  
**Location** พื้นที่เคาะแบบขึงงาน รง.2 (N6)  
**Measurement Date** May 13, 2025  
**Measurement by** Supot Salamteh

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:20 AM - 10:20 AM	89.0	101.5	79.6
10:20 AM - 11:20 AM	89.8	101.2	87.3
11:20 AM - 12:20 PM	89.5	100.9	85.0
12:20 PM - 01:20 PM	89.1	99.0	87.3
01:20 PM - 02:20 PM	89.9	101.9	87.1
02:20 PM - 03:20 PM	89.9	101.2	87.2
03:20 PM - 04:20 PM	89.0	102.0	86.8
04:20 PM - 05:20 PM	89.8	99.6	87.0

Leq Average 8 hrs. (dB(A)) 89.5  
Lmax (dB(A)) 102.0  
Standard (dB(A)) 90  
Reference Method : ISO1996-1 and 1996-2  
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย  
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Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Stack	Total Suspended Particulate	Console Control Unit	BKK_FS0556	10-Jan-25	10-Jul-25	6
Stack	Total Suspended Particulate	Console Control Unit	BKK_FS0518	10-Jan-25	10-Jul-25	6
Stack	Total Suspended Particulate	Pitot Tube	BKK_FS0561	10-Jan-25	10-Jul-25	6
Stack	Total Suspended Particulate	Pitot Tube	BKK_FS0523	10-Jan-25	10-Jul-25	6
Stack	Total Suspended Particulate	Flue gas Analyzer	RYG_FS0565	7-Nov-24	7-Nov-25	12
Stack	Total Suspended Particulate	Flue gas Analyzer	RYG_FS0711	16-Jul-24	16-Jul-25	12
Stack	Total Suspended Particulate	Digital Balance	RYG_EN0003	20-Feb-25	20-Feb-26	12
Ambient	Total Suspended Particulate	High Volume	RYG_FS0291	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKK_FS0369	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_FS0664	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	RYG_EN0001	20-Feb-25	20-Feb-26	12
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	BKK_FS0919	26-Aug-24	26-Feb-26	18
Noise	Leq 24 hrs	Sound Calibrator	RYG_FS0216	22-Oct-24	22-Oct-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0615	23-Dec-24	23-Dec-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0612	23-Dec-24	23-Dec-25	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0495	27-Jan-25	26-Jan-26	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0614	23-Dec-24	23-Dec-25	12
Noise	Leq 8 hrs	Sound Calibrator	RYG_FS0213	16-Jan-25	16-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0384	9-Oct-24	9-Oct-25	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0304	30-Aug-24	30-Aug-25	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0303	23-Aug-24	23-Aug-25	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0300	30-Aug-24	30-Aug-25	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0381	9-Oct-24	9-Oct-25	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0302	19-Sep-24	19-Sep-25	12
Noise	Leq 8 hrs	Sound Calibrator	RYG_FS0213	16-Jan-25	16-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0022	19-Mar-25	19-Mar-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0018	21-Jan-25	21-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0020	21-Jan-25	21-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0023	19-Mar-25	19-Mar-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0019	21-Jan-25	21-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0024	21-Jan-25	21-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0226	27-Jan-25	26-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0356	7-Jan-25	7-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0358	7-Jan-25	7-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0359	8-Jan-25	8-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0578	6-Aug-24	6-Aug-25	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0579	6-Aug-24	6-Aug-25	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0580	7-Aug-24	7-Aug-25	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0581	7-Aug-24	7-Aug-25	12
Rayong Lab	pH at 25 °C	pH meter	RYG_EN0183	19-Jan-24	19-Jul-25	18
Rayong Lab	Color (at Original pH)	Spectrophotometer	RYG_EN0037	18-Mar-25	18-Sep-26	18
Rayong Lab	Color (at pH 7.0)	Spectrophotometer	RYG_EN0037	18-Mar-25	18-Sep-26	18
Rayong Lab	BOD	DO meter with Sensor	RYG_EN0032	20-Jan-25	20-Jul-26	18
Rayong Lab	BOD	Incubator	RYG_EN0154	1-Nov-24	1-May-26	18
Rayong Lab	BOD	Burette	RYG_EN0216	24-Sep-24	24-Sep-25	12
Rayong Lab	COD	Spectrophotometer	RYG_EN0037	18-Mar-25	18-Sep-26	18
Rayong Lab	Total Suspended Solids	Electronic Balance	RYG_EN0002	20-Feb-25	20-Feb-26	12
Rayong Lab	Total Suspended Solids	Hot Air Oven	RYG_EN0010	21-Mar-24	21-Sep-25	18
Rayong Lab	Total Dissolved Solids 180°C	Electronic Balance	RYG_EN0002	20-Feb-25	20-Feb-26	12
Rayong Lab	Total Dissolved Solids 180°C	Hot Air Oven	RYG_EN0010	21-Mar-24	21-Sep-25	18
Rayong Lab	Oil & Grease	Electronic Balance	RYG_EN0002	20-Feb-25	20-Feb-26	12
Rayong Lab	Oil & Grease	Hot Air Oven	RYG_EN0213	19-Mar-25	19-Mar-26	12
Rayong Lab	Oil & Grease	Water Bath	RYG_EN0061	21-Mar-24	21-Sep-25	18



CONSOLE CONTROL UNIT CALIBRATION TEST REPORT

Calibration of Date : 10-Jan-25  
Next Cal. Date : 10-Jul-25  
Barometric Pressure (mmHg) : 756.2  
Relative Humidity (%) : 37.9  
Temperature (C°) : 28.1

Console Control Meter Data

Calibration No. : C-100125-BKK\_FS0556  
Dry Gas Meter ID : BKK\_FS0556  
Serial No. : 1600041  
Model No. : XC-572-V  
Reference Dry Gas Meter ID : BKK\_FS1122  
Serial No. : A2003240  
Correction Factor (Y) : 1.0000  
Next Calibration Date : 25-Feb-26

ΔH (mm-H <sub>2</sub> O)	Θ Minutes	Reference Dry Gas Meter Calibration						Console Control : Drygas Meter										Dry Gas Meter Correction Factor (Y)	Orifice Calibration Factor ΔAvg
		Vr (Liters)			Tr (°C)			Vm (Liters)			Tt (°C)								
		Final	Initial	Total	Final	Initial	Total	Final	Initial	Total	Final	Initial	Total	Final	Initial	Total			
15	11.41	150.00	0.00	150.00	31.0	150.00	31.0	464656.0	464513.0	145.00	31.0	31.0	31.0	1.0350	40.1599				
25	8.87	150.00	0.00	150.00	31.0	150.00	31.0	464656.0	464683.0	145.00	31.0	31.0	31.0	1.0320	40.1499				
50	6.42	150.00	0.00	150.00	32.0	150.00	32.0	464686.0	464623.0	145.00	31.0	31.0	31.0	1.0261	42.6601				
80	5.05	150.00	0.00	150.00	32.0	150.00	32.0	465126.0	464882.0	144.00	31.0	31.0	31.0	1.0302	42.2333				
120	4.08	150.00	0.00	150.00	32.0	150.00	32.0	465297.0	465153.0	144.00	31.0	31.0	31.0	1.0263	41.3608				
														Avg:	41.3708				

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

ΔAvg - Orifice pressure differential that equates to 21.24 in of air @ 25°C and 760 mm of mercury, mmH<sub>2</sub>O : tolerance for individual values ± 5.08 from average

Procedure: 40 CFR 60 APP A METH. SEC 5.3 & 7

Calibrated by:

(Mr. Warawut Pubpa)  
RYG Field Service Scientist(3)

Approved by:

(Mr.Natthapol Jengwarewong)  
RYG Field Service Specialist(1)  
FORM NO. F 06-027 REVISION NO. 2 ISSUE DATE: 30 Jan 22



DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date : 10 Jan 25		Ambient Temperature (°C) 28.1			
Calibration sheet No. : C-100125-BKK_FS0557		Relative Humidity (%) : 37.9			
Digital Temperature ID : BKK_FS0557		Reference Temperature ID RYG_FS0681			
Serial No. : 1606041		Serial No. : 201090014918			
Model : XC-572-V		Model : Digicon-CC-VT-MS			
Next Calibrate :		13 May 25			
Location	Reference Temperature °C	Digital Temperature °C	Error °C	MPE	Pass / Fail
Stack	0	0	0	±3	Pass
	25	24	-1	±3	Pass
	50	49	-1	±3	Pass
	100	99	-1	±3	Pass
	150	149	-1	±3	Pass
	200	199	-1	±3	Pass
Probe	250	249	-1	±3	Pass
	300	299	-1	±3	Pass
	500	499	-1	±3	Pass
	100	99	-1	±3	Pass
	120	119	-1	±3	Pass
	140	139	-1	±3	Pass
Oven	100	99	-1	±3	Pass
	120	119	-1	±3	Pass
	140	139	-1	±3	Pass
Filter	100	100	0	±3	Pass
	120	120	0	±3	Pass
	140	141	1	±3	Pass
Exit	0	0	0	±3	Pass
	10	10	0	±3	Pass
	20	20	0	±3	Pass
Meter	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
AUX	0	0	0	±3	Pass
	25	24	-1	±3	Pass
	50	49	-1	±3	Pass

MPE : (Maximum permissible error of measurement) ค่าความผิดพลาดสูงสุดของกรรพที่อนุญาต

Calibrated by :

(Mr. Warawut Pubpa)  
RYG Field Service Scientist (3)

Approved by :

(Mr.Natthapol Jengwarewong)  
RYG Field Service Specialist (1)

FORM NO. F 06-027 REVISION NO. 2 ISSUE DATE: 9 Feb 23

PROBE NOZZLE DIAMETER  
CALIBRATION DATA SHEET

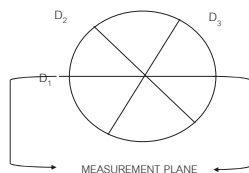
Calibration Date : 10 Jan 25		Nozzle Set ID. : BKK_FS0562			
Calibration Sheet No. : C-100125-BKK_FS0562		Vernier Caliper ID. : BKK_FS1123			
Nozzle ID #	Nozzle Diameter (cm.)			Hi - Lo ΔD	(D <sub>1</sub> + D <sub>2</sub> + D <sub>3</sub> ) / 3 D <sub>avg</sub>
	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>		
1	0.300	0.300	0.305	0.005	0.302
2	0.485	0.475	0.485	0.010	0.482
3	0.530	0.535	0.530	0.005	0.532
4	0.625	0.630	0.630	0.005	0.628
5	0.760	0.760	0.765	0.005	0.762
6	0.975	0.980	0.980	0.005	0.978
7	1.085	1.085	1.081	0.004	1.084
8	1.275	1.275	1.275	0.000	1.275
9	1.605	1.610	1.615	0.010	1.610

Where :

D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub> = There different nozzle diameters at 60 degrees to each other, each measured the nearest 0.025 mm.

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

D<sub>avg</sub> = (D<sub>1</sub> + D<sub>2</sub> + D<sub>3</sub>) / 3



Calibrated by :

(Mr. Warawut Pubpa)  
RYG Field Service Scientist (3)

Approved by :

(Mr.Natthapol Jengwarewong)  
RYG Field Service Specialist (1)

FORM NO. F 06-026 REVISION NO. 2 ISSUE DATE: 30 Jan 22



CONSOLE CONTROL UNIT CALIBRATION TEST REPORT

Calibration of Date : 10-Jan-25  
Next Cal. Date : 10-Jul-25  
Barometric Pressure (mmHg) : 755.6  
Relative Humidity (%) : 56.5  
Temperature (C°) : 28.8

Console Control Meter Data

Calibration No. : C-100125-BKK\_FS0518  
Dry Gas Meter ID : BKK\_FS0518  
Serial No. : 1504025  
Model No. : XC-572-V  
Reference Dry Gas Meter ID : BKK\_FS1122  
Serial No. : A2003240  
Correction Factor (Y) : 1.0000  
Next Calibration Date : 25-Feb-26

ΔH (mm H <sub>2</sub> O)	Θ Minutes	Reference Dry Gas Meter Calibration						Console Control Dry Gas Meter						Dry Gas Meter Correction Factor (Y)	Office Calibration Factor ΔAvg
		Vr (Litres)			Tr (°C)			Vm (Litres)			Tt (°C)				
		Final	Initial	Total	Final	Initial	Total	Final	Initial	Total	Final	Initial	Total		
15	12.02	150.00	0.00	150.00	31.0	833081.0	832928.0	153.00	30.0	30.0	30.0	0.9757	44.7513		
25	9.47	150.00	0.00	150.00	31.0	833251.0	833098.0	153.00	31.0	31.0	31.0	0.9780	46.1439		
50	6.61	150.00	0.00	150.00	31.0	833431.0	833277.0	154.00	32.0	32.0	32.0	0.9725	44.8148		
80	5.18	150.00	0.00	150.00	31.0	833902.0	833447.0	155.00	32.0	32.0	32.0	0.9634	44.0350		
120	4.19	150.00	0.00	150.00	32.0	833766.0	833613.0	153.00	32.0	32.0	32.0	0.9691	43.5021		
												0.9718	44.6584		

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

ΔAvg - Orifice pressure differential that equates to 21.24 in of air @ 25°C and 760 mm of mercury, mmH<sub>2</sub>O : tolerance for individual values ± 5.08 from average

Procedure: 40 CFR 60 APP A METH. SEC 5.3 & 7

Calibrated by:

(Mr. Warawut Pubpa)  
RYG Field Service Scientist(3)

Approved by:

(Mr.Natthapol Jengwarewong)  
RYG Field Service Specialist(1)  
FORM NO. F 06-024 REVISION NO. 2 ISSUE DATE: 30 Jan 22



### DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date :	10 Jan 25	Ambient Temperature (°C)	28.8		
Calibration sheet No. : C-100125-BKK_FS0519		Relative Humidity (%) :	56.5		
Digital Temperature ID : BKK_FS0519		Reference Temperature ID	RYG_FS0681		
Serial No. : 1504025		Serial No. :	201090014918		
Model : XC-572-V		Model :	Digicon-CC-VT-MS		
		Next Calibrate :	13 May 25		
Location	Reference Temperature °C	Digital Temperature °C	Error °C	MPE	Pass / Fail
Stack	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
	100	100	0	±3	Pass
	150	150	0	±3	Pass
	200	201	1	±3	Pass
Probe	250	251	1	±3	Pass
	300	301	1	±3	Pass
	500	501	1	±3	Pass
	100	100	0	±3	Pass
	120	121	1	±3	Pass
	140	141	1	±3	Pass
Oven	100	100	0	±3	Pass
	120	121	1	±3	Pass
	140	141	1	±3	Pass
Filter	100	100	0	±3	Pass
	120	121	1	±3	Pass
	140	141	1	±3	Pass
Exit	0	0	0	±3	Pass
	10	9	-1	±3	Pass
	20	19	-1	±3	Pass
Meter	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	51	1	±3	Pass
AUX	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	51	1	±3	Pass

MPE : (Maximum permissible error of measurement) ค่าความผิดพลาดสูงสุดของเครื่องมือวัด

Calibrated by :

Mr. Warawut Pubpa

RYG Field Service Scientist (3)

Approved by :

Mr.Natthapol Jiengwarewong

RYG Field Service Specialist (1)

FORM NO.: F 06-027 REVISION NO.: 2 ISSUE DATE: 9 Feb 23



### PROBE NOZZLE DIAMETER CALIBRATION DATA SHEET

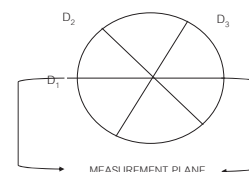
Calibration Date :	10 Jan 25	Nozzle Set ID. :	BKK_FS0524		
Calibration Sheet No. : C-100125-BKK_FS0524	Vernier Caliper ID.:		BKK_FS1123		
Nozzle ID #	Nozzle Diameter (cm.)			Hi - Lo	(D <sub>1</sub> + D <sub>2</sub> + D <sub>3</sub> ) / 3
	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	ΔD	D <sub>avg</sub>
1	0.318	0.318	0.318	0.000	0.318
2	0.472	0.474	0.475	0.003	0.474
3	0.545	0.540	0.540	0.005	0.542
4	0.632	0.635	0.634	0.003	0.634
5	0.792	0.792	0.792	0.000	0.792
6	0.952	0.952	0.952	0.000	0.952
7	1.091	1.110	1.092	0.019	1.098
8	1.256	1.262	1.262	0.006	1.260
9	1.601	1.598	1.600	0.003	1.600

Where :

D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub> = There different nozzle diameters at 60 degrees to each other, each measured the nearest 0.025 mm.

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

D<sub>avg</sub> = (D<sub>1</sub> + D<sub>2</sub> + D<sub>3</sub>) / 3



Calibrated by :

( Mr.Warawut Pubpa )

RYG Field Service Scientist (3)

Approved by :

( Mr.Natthapol Jiengwarewong )

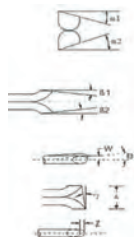
RYG Field Service Specialist (1)

FORM NO.: F 06-028 REVISION NO.: 1 ISSUE DATE: 16 Feb 2023



### Type S Pitot Tube Calibration

Date Calibration 10-Jan-25 Due Date 10-Jul-25  
Pitot ID BKK\_FS0561 Inclinator ID BKK\_FS1131  
Pitot SN - Vernier ID RYG\_FS0539



Parameter	Value	Allowable Range	Check
α1	-2.4	-10° < α1 < +10°	OK
α2	-1.2	-10° < α2 < +10°	OK
β1	-2.0	-5° < β1 < +5°	OK
β2	1.3	-5° < β2 < +5°	OK
γ	0.3	-	-
θ	0.2	-	-
Z = A tan γ	0.005	Z ≤ 0.125"	OK
W = A tan θ	0.003	W ≤ 0.031"	OK
Dt	0.310	0.188" to 0.375"	OK
A/2Dt	1.468	1.05 ≤ PA/Dt ≤ 1.5	OK
A	0.91	2.1Dt ≤ A ≤ 3Dt	OK

Certify that pitot tube/porbe meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube certification fact of 0.84 . See 40 CFR Pt. 60, App. A,EPA Method 2.

Calibrated by :

( Mr. Warawut Pubpa )

RYG Field Services Scientist (3)

Approved By :

( Mr.Natthapol Jiengwarewong )

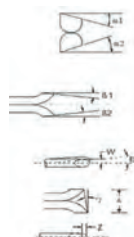
RYG Field Services Specialist (1)

FORM NO.: F 06-124 REVISION NO.: 0 ISSUE DATE: 25/12/23



### Type S Pitot Tube Calibration

Date Calibration 10-Jan-25 Due Date 10-Jul-25  
Pitot ID BKK\_FS0523 Inclinator ID BKK\_FS1131  
Pitot SN - Vernier ID RYG\_FS0539



Parameter	Value	Allowable Range	Check
α1	-0.2	-10° < α1 < +10°	OK
α2	2.4	-10° < α2 < +10°	OK
β1	-1.2	-5° < β1 < +5°	OK
β2	-1.6	-5° < β2 < +5°	OK
γ	-1.1	-	-
θ	0.2	-	-
Z = A tan γ	-0.018	Z ≤ 0.125"	OK
W = A tan θ	0.003	W ≤ 0.031"	OK
Dt	0.308	0.188" to 0.375"	OK
A/2Dt	1.494	1.05 ≤ PA/Dt ≤ 1.5	OK
A	0.92	2.1Dt ≤ A ≤ 3Dt	OK

Certify that pitot tube/porbe meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube certification fact of 0.84 . See 40 CFR Pt. 60, App. A,EPA Method 2.

Calibrated by :

( Mr. Warawut Pubpa )

RYG Field Services Scientist (3)

Approved By :

( Mr.Natthapol Jiengwarewong )



RYG Field Services Specialist (1)

FORM NO.: F 06-124 REVISION NO.: 0 ISSUE DATE: 25/12/23



Certificate No.: G 670781  
Date of issue : 07-Nov-24

Instrument description : Flue Gas Analyzer  
Instrument model : Testo 340  
Instrument serial no. : 63119028  
Control unit serial no. : -  
ID no. or control no. : RYG\_FS0565  
Manufacturer : Testo SE & Co. KGaA  
Probe description : -  
Probe model : -  
Probe serial no. : -  
Customer name : ALS LABORATORY GROUP (THAILAND) CO., LTD.  
Customer address : 104 Phatthanakan 40, Phatthanakan Road, Khwaeng Phatthanakan, Khet Suan Luang, Bangkok, 10250 Thailand  
Total pages of certificate : 3 Pages  
Receiving no. : L-244321  
Receiving date : 05-Nov-24  
Parameter of calibration : Gas Calibration (Oxygen 2.50, 9.984, 21.02 % Vol, Carbon Monoxide 80.18, 302, 1007 ppm; Nitric Oxide 30.0, 151.5, 322.5 ppm; Sulphur Dioxide 50.36, 100.8, 600.8 ppm)  
Condition of UUC : Used  
Ambient condition : All of the Measurement were carried out the stabilized laboratory  
Temperature : 23 ± 5 °C  
Humidity : 55 ± 15 %RH  
Calibration place : 17/121 Soi Ngamwongwan 47 Yae 48, Toongsonghong, Lakki, Bangkok 10210 THAILAND  
Calibration procedure no. : This instrument was calibrated by comparison with Standard gas mixture according to calibration Work Instruction no. WI-CL-28-C

REVIEW BY:   
APPROVED BY:   
NEXT CAL DATE: 7-Nov-25

The calibration certificate expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by coverage factor  $k=2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%. This certificate is applied only to item under test Environmental condition.  
This Calibration Certificate may not be reproduced other than in full except with the permission of the issuing laboratory. Calibration certificates without signature and seal not valid and The results relate only to the items tested/calibrated.  
This calibration certificate documents are traceability to national standards, which realize measurement according to the International System of Units (SI).

Date of calibration : 07-Nov-24

  
Mr. Kwanthai Khamdang  
Calibration Technician

  
Mrs. Nongluck Wongsettee  
Technical Manager

FM-CL-08-C Rev.8

Page 1 of 3

Issued Date 26/02/16

ENTECH INDUSTRIAL SOLUTION CO., LTD.

17/121 Soi Ngamwongwan 47 Yae 48, Toongsonghong, Lakki, Bangkok 10210 THAILAND Tel: 0-2779-8888 Fax: 0-2779-8889 info@entech.co.th  
Tax ID : 01105536035591 www.entech.co.th

Certificate No.: G 670781

Standard References (Table 1)

Standard	Certificate No.	Vendor	Due date
Oxygen (O <sub>2</sub> ) 2.50 % Vol	2412/23	Linde	27-Aug-27
Oxygen (O <sub>2</sub> ) 9.984 % Vol	CG-0113-24	Nimt	01-Aug-29
Oxygen (O <sub>2</sub> ) 21.02 % Vol	CG-0041-22	Nimt	10-Feb-27
Carbon monoxide (CO) 80.18 ppm	CG-0002-24	Nimt	11-Jan-29
Carbon monoxide (CO) 302 ppm	1915/23	Linde	16-Jun-25
Carbon monoxide (CO) 1007 ppm	1870/24	Linde	17-Jun-26
Nitric Oxide (NO) 30.0 ppm	CG-0065-24	Nimt	06-May-26
Nitric Oxide (NO) 151.5 ppm	0161/23	Linde	22-Jan-25
Nitric Oxide (NO) 322.5 ppm	1974/23	Linde	17-Jul-25
Sulphur Dioxide (SO <sub>2</sub> ) 50.36 ppm	2004/23	Linde	17-Jul-25
Sulphur Dioxide (SO <sub>2</sub> ) 100.8 ppm	3507/22	Linde	09-Nov-24
Sulphur Dioxide (SO <sub>2</sub> ) 600.8 ppm	2003/23	Linde	17-Jul-25

Measured room conditions

Temperature : 21.8 °C Humidity : 59.7 %RH Pressure : 1010.1 mbar

Calibration conditions

Gas Temperature : 23 °C Flow rate : 600 ml/min Gas pressure : 1012.4 mbar

Calibration Results (Before adjustment) (Table 2)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (±)
O <sub>2</sub> (%Vol)	2.50	2.47	-0.03	0.15
O <sub>2</sub> (%Vol)	9.984	9.92	-0.064	0.20
O <sub>2</sub> (%Vol)	21.02	21.11	0.09	0.30
CO (ppm)	80.18	77	-3.18	3.0
CO (ppm)	302	295	-7	6.0
CO (ppm)	1007	986	-21	12
NO (ppm)	30.0	27	-3.0	8.0
NO (ppm)	151.5	147	-4.5	8.0
NO (ppm)	322.5	311	-11.5	12
SO <sub>2</sub> (ppm)	50.36	51	0.64	6.0
SO <sub>2</sub> (ppm)	100.8	102	1.2	6.0
SO <sub>2</sub> (ppm)	600.8	603	2.2	13

FM-CL-08-C Rev.8

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Issued Date 26/02/16

ENTECH INDUSTRIAL SOLUTION CO., LTD.

17/121 Soi Ngamwongwan 47 Yae 48, Toongsonghong, Lakki, Bangkok 10210 THAILAND Tel: 0-2779-8888 Fax: 0-2779-8889 info@entech.co.th  
Tax ID : 01105536035591 www.entech.co.th

Certificate No.: G 670781

Calibration Results (After adjustment) (Table 3)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (±)
O <sub>2</sub> (%Vol)	2.50	2.47	-0.03	0.15
O <sub>2</sub> (%Vol)	9.984	9.92	-0.064	0.20
O <sub>2</sub> (%Vol)	21.02	21.11	0.09	0.30
CO (ppm)	80.18	80	-0.18	3.0
CO (ppm)	302	302	0	6.0
CO (ppm)	1007	1004	-3	12
NO (ppm)	30.0	31	1.0	8.0
NO (ppm)	151.5	153	1.5	8.0
NO (ppm)	322.5	321	-1.5	12
SO <sub>2</sub> (ppm)	50.36	51	0.64	6.0
SO <sub>2</sub> (ppm)	100.8	102	1.2	6.0
SO <sub>2</sub> (ppm)	600.8	603	2.2	13

Remark : 1 cmol/mol = 1 %vol, 1 μmol/mol = 1 ppm

End of Report

FM-CL-08-C Rev.8

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Issued Date 26/02/16

ENTECH INDUSTRIAL SOLUTION CO., LTD.

17/121 Soi Ngamwongwan 47 Yae 48, Toongsonghong, Lakki, Bangkok 10210 THAILAND Tel: 0-2779-8888 Fax: 0-2779-8889 info@entech.co.th  
Tax ID : 01105536035591 www.entech.co.th

testo

Calibration certificate Kalibrier-Zertifikat

5753561

Object Gegenstand: Control Unit t350 Measuring Box testo 350  
Manufacturer Hersteller: TESTO SE & Co. KGaA TESTO SE & Co. KGaA  
Type description Typ: 0632 3511 0632 3510  
Serial no. Serien Nr.: 64554897 64749496  
Inventory no. Inventar Nr.: ---  
Test equipment no. Prüfmittel Nr.: ---  
Equipment no. Equipment Nr.: 15862485 15861584  
Location Standort: ---  
Customer Auftraggeber: ALS Laboratory Group (Thailand) Co., Ltd  
104 Phatthanakan 40, Phatthanakan Rd.,  
Khwaeng Phatthanakan, Khet Suan Luang  
TH Bangkok 10250 Thailand  
Customer ID no. Kunden Nr.: 1031994  
Order no. Auftrags Nr.: 12459724 / 0520 0055

Hereby we confirm that the performing calibration laboratory is working with a management system according to ISO 9001:2015 and DIN EN ISO/IEC 17025:2018. Accreditation certificates can be found under [www.testo.de](http://www.testo.de). The measuring installations used for calibration are regularly calibrated and traceable to the national standards of the German Federal Physical Technical Institute (PTB) or other national standards. Should no national standards exist, the measuring procedure corresponds with the technical regulations and norms valid at the time of the measurement. The documents established for this procedure are available for viewing. All the necessary measured data can be found on this calibration certificate.

Hiermit bestätigen wir, dass das durchführende Kalibrierlabor ein Managementsystem nach ISO 9001:2015, sowie DIN EN ISO/IEC 17025:2018 eingetragt hat. Die Urkunden finden Sie auf [www.testo.de](http://www.testo.de). Die für die Kalibrierung verwendeten Messanrichtungen werden regelmäßig kalibriert und sind rückführbar auf die nationalen Normale der Physikalisch-Technischen Bundesanstalt (PTB) Deutschlands oder auf andere nationale Normale. Wo keine nationalen Normale existieren, entspricht das Messverfahren den derzeit gültigen technischen Regeln und Normen. Die für diesen Vorgang angelegte Dokumentation kann eingesehen werden. Alle erforderlichen Messdaten sind in diesem Kalibrier-Zertifikat aufgeführt.

Date of calibration Datum der Kalibrierung: 16.07.2024  
Date of the recommended re-calibration Datum der empfohlenen Rekalibrierung: 16.07.2025  
Conformity statement Konformitätsaussage: Pass

REVIEW BY:   
APPROVED BY:   
NEXT CAL DATE: 16/7/25

The expanded uncertainty of measurement was calculated according to EA-4/02 M:2002 with a coverage probability of about 95% and contains the uncertainty of the reference, the uncertainty of the method and the uncertainty of the test specimen. The conformity statement is made according to the decision rule "confidence level 95".  
Die erweiterte Messunsicherheit wurde nach EA-4/02 M:2002 mit einer Überdeckungswahrscheinlichkeit von etwa 95% berechnet und enthält die Unsicherheit der Referenz, des Verfahrens sowie die Unsicherheit des Prüflings. Die Konformitätsaussage erfolgt nach der Entscheidungsregel "Vertrauensniveau 95".  
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Dieser Kalibrierschein darf nur vollständig weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung des ausstellenden Kalibrierlaboratoriums. Kalibrierscheine ohne Unterschrift und Stempel haben keine Gültigkeit.

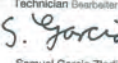
Seal Stempel



Supervisor Fachverantwortlicher

  
Martin Förderer

Technician Bearbeiter

  
Samuel Garcia Zloti

Testo Industrial Services GmbH

Gewerbestraße 3  
79199 Kirchzarten

Tel: +49 7861 90901-3000  
Fax: ---

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testo

Calibration certificateKalibrier-Zertifikat

5753561

Measuring equipmentMessseinrichtungen

Index	Reference	Traceability	Next cal.	Certificate-no.	Eq.-no.
a	Test gas medium 1 Prüfgas Medium 1	SCS-SCS008 2024-02	2025-02	5514470	12899976
b	Test gas medium 3 Prüfgas Medium 3	SCS-SCS008 2024-02	2025-02	5504390	12899980
c	Test gas medium 5 Prüfgas Medium 5	SCS-SCS008 2024-02	2025-02	5501047	12899984
d	Test gas medium 8 Prüfgas Medium 8	SCS-SCS008 2024-02	2025-02	5516320	12899987
e	Test gas medium 7 Prüfgas Medium 7	SCS-SCS008 2024-02	2025-02	5514483	12899988
f	Test gas medium 11 Prüfgas Medium 11	SCS-SCS008 2024-02	2025-02	5516305	14087864

Reference certificates are available at [www.primosonline.com](http://www.primosonline.com) Referenzzertifikate sind auf [www.primosonline.com](http://www.primosonline.com) abrufbar

Ambient conditionsUmgebungsbedingungen

TemperatureTemperatur (20...26) °C HumidityFeuchte (20...60) % RH % rF

Measuring procedureMessverfahren

The calibration was carried out by comparison measurement with calibrated test gases.  
Die Kalibrierung erfolgte durch Vergleichsmessung mit kalibrierten Prüfgasen.

Measuring resultsMessergebnisse

ChannelKanal ---

Reference value Bezugswert		Indicated measured value probe Angezeigter Messwert Kal- ibriergegenstand		Deviation Abweichung		Allowed deviation <sup>1)</sup> Zulässige Abweichung <sup>1)</sup>		Measurement uncertainty (k=2) Messunsicherheit (k=2)		Confirmation Bestätigung
ppm	Vol.-%	ppm	Vol.-%	ppm	Vol.-%	ppm	Vol.-%	ppm	Vol.-%	
CO										
100.6 <sup>a</sup>	---	100	---	-0.6	---	± 11	---	3.3	---	pass
401.0 <sup>b</sup>	---	403	---	2.0	---	± 21	---	8.4	---	pass
700.0 <sup>c</sup>	---	702	---	2.0	---	± 38	---	14.4	---	pass
NO										
150.2 <sup>a</sup>	---	151	---	0.8	---	± 9	---	4.0	---	pass
300 <sup>b</sup>	---	302	---	2	---	± 16	---	6.9	---	pass
NO2										
100.4 <sup>a</sup>	---	102.3	---	1.9	---	± 5.1	---	3.20	---	pass
SO2										
97.9 <sup>f</sup>	---	98	---	-1.9	---	± 6	---	3.5	---	pass
O2										
---	0.00 <sup>a</sup>	---	0.09	---	0.09	---	± 0.21	---	0.027	pass
---	2.52 <sup>a</sup>	---	2.57	---	0.05	---	± 0.21	---	0.055	pass
---	5.01 <sup>b</sup>	---	5.17	---	0.16	---	± 0.21	---	0.102	pass

<sup>1)</sup> in accordance with the manufacturer gemäß Hersteller

RemarksBemerkungen

---

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79189 Kirchzarten

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SARTORIUS

Accredited by

NSC-TISI-TIS 17025

Calibration 0426

ILAC-MRA

NSC-TISI-TIS 17025  
CALIBRATION 0426

Calibration certificate

Calibration Certificate No. 25BKL0003

Object

Electronic non-automatic weighing instrument

This calibration certificate documents the traceability to national standards.

Manufacturer

Sartorius

Uncertainties of measurements are taken into account when only statements of compliance are made.

Type

MSU224S-100-DU

This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP WI 08.

Serial | QM Ident. no.

31709552 | RYG\_EN0003

This certificate relate and apply this equipment only.

Customer

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

616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.

Order no.

2230

Number of pages

4

Date of calibration

20 Feb 2025

REVIEW BY

Tharitak

APPROVED BY

D. Jansen

NEXT CAL DATE

20/02/26

This calibration certificate may not be reproduced other than in full except with the permission of NSC-TISI-TIS-17025 and the issuing laboratory. Calibration certificates without signature are not valid.

The user is obliged to have the object recalibrated at appropriate intervals.

Date

06 Mar 2025

Approval of the Calibration Certificate

Person in charge

Mr. Chonchai Inthana

Kachen Lalee

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Calibration certificate No.: 25BKL0003

Calibration Certificate

Calibration object

Single range instrument

Model

MSU224S-100-DU

Serial Number

31709552

QM Ident. no | Inventory no.

RYG\_EN0003 | ---

Maximum capacity (Max. load)

220.0000 g

Measured range

220.0000 g

Scale interval

0.0001 g

Place of calibration

Address

According to page 1

Department | Cost center

Laboratory Department. | ---

Building | Floor

--- | 1st Floor.

Room

Balance Room.

Maximum temperature variation at place of calibration

5 K

Calibration procedure

EURAMET cg-18, V4.0 - Guidelines on the Calibration of Non-Automatic Weighing Instruments

Test equipment

Test equipment type

Test equipment ID

Valid until

Thermometer

MHB-382SD s/nB011342 Traceable to SI unit through DKSH

21 Aug 2025

Test weight set OIML R111 E2

Certificate No.M2308197S .E2(Traceable to SI unit through TCS)

23 Aug 2025

Sartorius (Thailand) Co., Ltd.

129 Rama 9 Road, Huaykwang

10310 Bangkok

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Page

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Calibration certificate No.: 25BKL0003

Calibration Certificate

Adjustment Status

The measuring device was internally adjusted before the calibration.

Environmental and measuring conditions

Date of calibration

20 Feb 2025

Temperature at place of calibration | Temp. diff.

24.7 °C | 0.3 K

Twights - Tplace

Measuring conditions

The installation site is suitable. The device was levelled. Balance was loaded up to Max before test.

Comments

Humidity 62.3 %RH.

Measurement results | Measurement uncertainties

Repeatability

Test load (nominal): 10 g | 200 g

10 g

200 g

1

10.0000 g

200.0000 g

2

10.0000 g

200.0001 g

3

9.9999 g

200.0000 g

4

10.0000 g

200.0000 g

5

10.0000 g

200.0001 g

6

9.9999 g

200.0000 g

7

10.0000 g

200.0000 g

8

10.0000 g

200.0000 g

9

10.0000 g

200.0000 g

10

10.0000 g

200.0001 g

s = 0.00004 g

s = 0.00005 g

Eccentricity

Test load (nominal): 100 g

Center

100.0000 g

Front left

100.0000 g

Back left

100.0001 g

Back right

99.9999 g

Front right

99.9999 g

Maximum deviation from centric loading indication

|Δlecc| max = 0.0001 g

Error of indication

Testload

Indication

Error

Expansion factor

Uncertainty

Uncertainty relative

0.0100 g

0.0100 g

0.0000 g

2.00

0.00012 g

1.2 %

0.1000 g

0.1000 g

0.0000 g

2.00

0.00013 g

0.13 %

0.5000 g

0.5000 g

0.0000 g

2.00

0.00013 g

0.026 %

1.0000 g

1.0000 g

0.0000 g

2.00

0.00013 g

0.013 %

5.0000 g

5.0000 g

0.0000 g

2.00

0.00013 g

0.0026 %

10.0000 g

10.0000 g

0.0000 g

2.00

0.00013 g

0.0013 %

20.0000 g

20.0000 g

0.0000 g

2.00

0.00014 g

0.00068 %

50.0000 g

50.0000 g

0.0000 g

2.00

0.00015 g

0.00029 %

100.0000 g

100.0001 g

0.0001 g

2.00

0.00018 g

0.00018 %

200.0000 g

200.0000 g

0.0000 g

2.00

0.00028 g

0.00014 %

220.0000 g

220.0000 g

0.0000 g

2.00

0.00032 g

0.00015 %

Maximum error of indication

|E| max = 0.0001 g

Urel(E) is the quotient of U(E) and test load L. The uncertainty of measurement U(E) is valid only if error E is considered. You will find reference notes on the uncertainty of measurement in use under Appendix to the calibration certificate | Interpretation of measurement results.

Reference note: The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the documented Expansion factor, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

End of calibration certificate

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129 Rama 9 Road, Huaykwang

10310 Bangkok

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## Uncertainty of measurement in use

Device adjusted before measurement

Yes

Temperature deviation considered

1.5 K (isoCAL active)

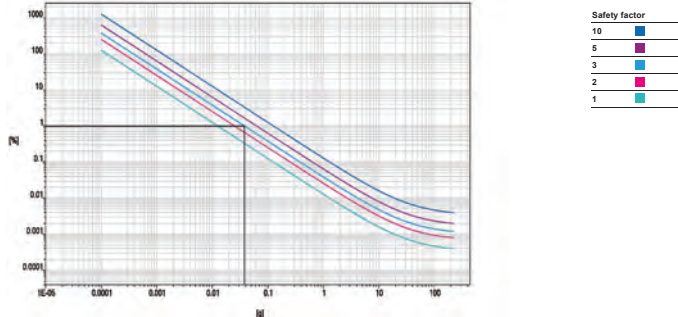
Temperature coefficient considered

1 · 10<sup>-4</sup>/KUncertainty of the weighing result  $U_{g(W)}$  $U_{g(W)} = 0.00013 \text{ g} + 3.42 \cdot 10^{-4} \cdot R$ 

Reference note: The current uncertainty of measurement is calculated by entering of the reading  $R$  into this formula. In relation to this, there is no need for a correction of the indication error. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied with an Expansion factor of 2, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

Indication in % from max load	Net indication $R$	Uncertainty $U_{g(W)}$	Uncertainty relative $U_{g(W)}/R$
1 %	2.2000 g	0.00014 g	0.0063 %
25 %	55.0000 g	0.00032 g	0.00058 %
50 %	110.0000 g	0.00051 g	0.00046 %
75 %	165.0000 g	0.00069 g	0.00042 %
100 %	220.0000 g	0.00088 g	0.00040 %

Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example

Process accuracy

1.00 %

Safety factor

3

Minimum sample weight

0.0380 g

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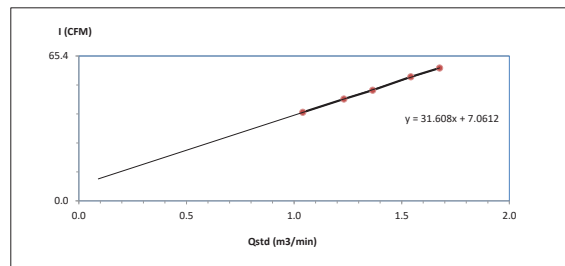
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## High Volume Air Sampler Calibration Worksheet

Project Site :	Kiriu (Thailand)Co.,Ltd	Barometric Pressure (mm Hg) :	759
Calibrate Location :	วัดคลองพลพเจ้าพรหม(A1)	Temperature ( °C ) :	31.2
Calibrate Date :	8-Mar-25	High Volume ID :	RYG_FS0291
CalibrationSheet No.:	C-080325-RYG_FS0291	High Volume Model :	TE-S170D
Calibrator ID:	RYG_FS0205	High Volume S/N :	5333
Calibrator Model :	TE-5028A	Calibrator Slope :	1.52567
Calibrator S/N :	1166	Calibrator Intercept :	-0.03613

Test No.	Delta H <sub>2</sub> O (inch)	Q <sub>std</sub> (m <sup>3</sup> /min)	I : Chart (CFM)	Linear Regression
1	2.4	1.0405	40	Slope : 31.6080
2	3.4	1.2315	46	Intercept : 7.0612
3	4.2	1.3648	50	Correlation Coefficient : 0.9998
4	5.4	1.5427	56	
5	6.4	1.6762	60	



Calibrated by :   
( Mr.Santi Chaichana )  
RYG-Field Services Scientist(2)

Approved by :   
(Mr. Supot Salameh)  
RYG-Field Services Section Head

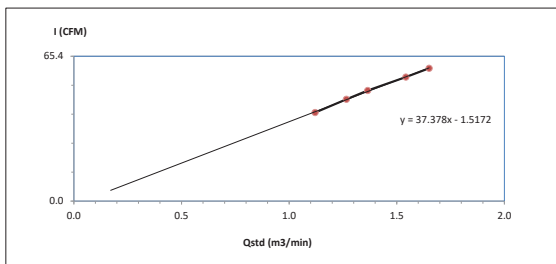
FORM NO.: F 06-073 REVISION NO.:2 ISSUE DATE: 20/11/23



## High Volume Air Sampler Calibration Worksheet

Project Site :	Kiriu (Thailand)Co.,Ltd	Barometric Pressure (mm Hg) :	759
Calibrate Location :	วัดคลองพลพเจ้าพรหม(A2)	Temperature ( °C ) :	31.2
Calibrate Date :	8-Mar-25	High Volume ID :	BKK_FS0369
CalibrationSheet No.:	C-080325-BKK_FS0369	High Volume Model :	TE-5009X
Calibrator ID:	RYG_FS0205	High Volume S/N :	4166
Calibrator Model :	TE-5028A	Calibrator Slope :	1.52567
Calibrator S/N :	1166	Calibrator Intercept :	-0.03613

Test No.	Delta H <sub>2</sub> O (inch)	Q <sub>std</sub> (m <sup>3</sup> /min)	I : Chart (CFM)	Linear Regression
1	2.8	1.1210	40	Slope : 37.3776
2	3.6	1.2662	46	Intercept : -1.5172
3	4.2	1.3648	50	Correlation Coefficient : 0.9990
4	5.4	1.5427	56	
5	6.2	1.6504	60	



Calibrated by :   
( Mr.Santi Chaichana )  
RYG-Field Services Scientist(2)

Approved by :   
(Mr. Supot Salameh)  
RYG-Field Services Section Head

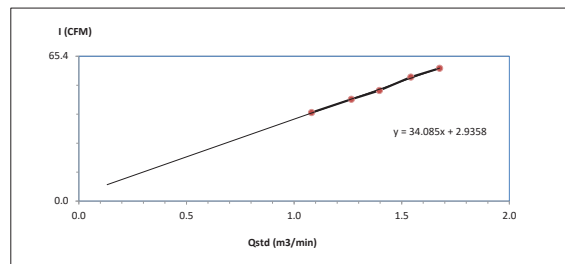
FORM NO.: F 06-073 REVISION NO.:2 ISSUE DATE: 20/11/23



## High Volume Air Sampler Calibration Worksheet

Project Site :	Kiriu (Thailand)Co.,Ltd	Barometric Pressure (mm Hg) :	759
Calibrate Location :	วัดราชวงศ์สลากรม(A3)	Temperature ( °C ) :	31.2
Calibrate Date :	8-Mar-25	High Volume ID :	RYG_FS0664
CalibrationSheet No.:	C-080325-RYG_FS0664	High Volume Model :	TE-5009X
Calibrator ID:	RYG_FS0205	High Volume S/N :	6261
Calibrator Model :	TE-5028A	Calibrator Slope :	1.52567
Calibrator S/N :	1166	Calibrator Intercept :	-0.03613

Test No.	Delta H <sub>2</sub> O (inch)	Q <sub>std</sub> (m <sup>3</sup> /min)	I : Chart (CFM)	Linear Regression
1	2.6	1.0815	40	Slope : 34.0851
2	3.6	1.2662	46	Intercept : 2.9358
3	4.4	1.3960	50	Correlation Coefficient : 0.9989
4	5.4	1.5427	56	
5	6.4	1.6762	60	



Calibrated by :   
( Mr.Santi Chaichana )  
RYG-Field Services Scientist(2)

Approved by :   
(Mr. Supot Salameh)  
RYG-Field Services Section Head

FORM NO.: F 06-073 REVISION NO.:2 ISSUE DATE: 20/11/23

Accredited by

NSC-TISI-TIS 17025  
Calibration 0426

## Calibration certificate

Calibration Certificate No. 25BK0001

Object	Electronic non-automatic weighing instrument	This calibration certificate documents the traceability to national standards.
Manufacturer	Sartorius	Uncertainties of measurements are taken into account when only statements of compliance are made.
Type	LA130S-F	This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP WI 08.
Serial   QM Ident. no.	25409664   RYG_EN0001	This certificate relate and apply this equipment only.
Customer	ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)	
	616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.	
Order no.	2230	
Number of pages	4	
Date of calibration	20 Feb 2025	

REVIEW BY .....  
APPROVED BY .....  
NEXT CAL DATE..... 20/02/26

This calibration certificate may not be reproduced other than in full except with the permission of NSC-TISI-TIS-17025 and the issuing laboratory. Calibration certificates without signature are not valid.

The user is obliged to have the object recalibrated at appropriate intervals.

Date	06 Mar 2025	Approval of the Calibration Certificate	Person in charge
		Mr. Chonchai Inthana	Kachen Lalee

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Calibration certificate No.: 25BK0001  
Calibration Certificate

## Calibration object

## Single range instrument

Model	LA130S-F
Serial Number	25409664
QM Ident. no   Inventory no.	RYG_EN0001   ---
Maximum capacity (Max. load)	150.0000 g
Measured range	150.0000 g
Scale interval	0.0001 g

## Place of calibration

Address	According to page 1
Department   Cost center	Laboratory Department.   ---
Building   Floor	---   1st Floor.
Room	Balance Room.
Maximum temperature variation at place of calibration	5 K

## Calibration procedure

EURAMET cg-18, V4.0 - Guidelines on the Calibration of Non-Automatic Weighing Instruments

## Test equipment

Test equipment type	Test equipment ID	Valid until
Thermometer	MHB-382SD s/nB011342 Traceable to SI unit through DKSH	21 Aug 2025
Test weight set OIML R111 E2	Certificate No.M2308197S ,E2(Traceable to SI unit through TCS)	23 Aug 2025

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Page 2 | 4

Calibration certificate No.: 25BK0001

Calibration Certificate

## Adjustment Status

The measuring device was internally adjusted before the calibration.

## Environmental and measuring conditions

Date of calibration	20 Feb 2025
Temperature at place of calibration   Temp. diff.	24.5 °C   1.0 K
Twights - Tplace	
Measuring conditions	The installation site is suitable. The device was levelled. Balance was loaded up to Max before test.
Comments	Humidity 58.0 %RH.

## Measurement results | Measurement uncertainties

Repeatability	Eccentricity
Test load (nominal): 10 g   100 g	Test load (nominal): 50 g
10 g100 g	Center50.0000 g
110.0000 g100.0000 g	Front left50.0001 g
29.9999 g100.0000 g	Back left50.0000 g
310.0000 g99.9999 g	Back right49.9999 g
410.0000 g100.0000 g	Front right50.0001 g
510.0000 g99.9999 g	Maximum deviation from centric loading indication
69.9999 g99.9999 g	Δlecc  max = 0.0001 g
710.0000 g100.0000 g	
810.0000 g100.0000 g	
910.0000 g100.0000 g	
1010.0000 g100.0000 g	
s = 0.00004 g s = 0.00005 g	

Error of indication	Expansion factor	Uncertainty	Uncertainty relative
Testload LIndication IError E	k	U(E)	Urel(E)
0.0100 g0.0100 g0.0000 g	2.00	0.00012 g	1.2 %
0.0500 g0.0500 g0.0000 g	2.00	0.00013 g	0.25 %
0.1000 g0.1000 g0.0000 g	2.00	0.00013 g	0.13 %
0.5000 g0.5000 g0.0000 g	2.00	0.00013 g	0.026 %
1.0000 g1.0000 g0.0000 g	2.00	0.00013 g	0.013 %
2.0000 g2.0000 g0.0000 g	2.00	0.00013 g	0.0065 %
5.0000 g5.0000 g0.0000 g	2.00	0.00013 g	0.0026 %
10.0000 g10.0000 g0.0000 g	2.00	0.00013 g	0.0013 %
20.0000 g20.0000 g0.0000 g	2.00	0.00014 g	0.00069 %
100.0000 g100.0000 g0.0000 g	2.00	0.00021 g	0.00021 %
150.0000 g149.9999 g-0.0001 g	2.00	0.00028 g	0.00019 %
Maximum error of indication	E max = 0.0001 g		

$U_{rel}(E)$  is the quotient of  $U(E)$  and test load  $L$ . The uncertainty of measurement  $U(E)$  is valid only if error  $E$  is considered. You will find reference notes on the uncertainty of measurement in use under Appendix to the calibration certificate | Interpretation of measurement results.  
Reference note: The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the documented Expansion factor, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

End of calibration certificate

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Interpretation of measurement results | Appendix to the calibration certificate

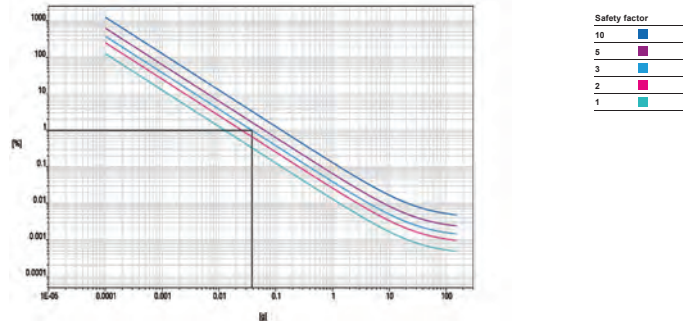
## Uncertainty of measurement in use

Device adjusted before measurement	Yes
Temperature deviation considered	1.5 K (isoCAL active)
Temperature coefficient considered	$1 \cdot 10^{-4} / K$
Uncertainty of the weighing result $U_g(W)$	$U_g(W) = 0.00013 \text{ g} + 3.96 \cdot 10^{-6} \cdot R$

Reference note: The current uncertainty of measurement is calculated by entering of the reading  $R$  into this formula. In relation to this, there is no need for a correction of the indication error. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied with an Expansion factor of 2, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

Indication in % from max load	Net indication $R$	Uncertainty $U_g(W)$	Uncertainty relative $U_g(W)_{rel}$
1 %	1.5000 g	0.00014 g	0.0091 %
25 %	37.5000 g	0.00028 g	0.00074 %
50 %	75.0000 g	0.00043 g	0.00057 %
75 %	112.5000 g	0.00058 g	0.00051 %
100 %	150.0000 g	0.00072 g	0.00048 %

## Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example	
Process accuracy	1.00 %
Safety factor	3
Minimum sample weight	0.0380 g

Sartorius (Thailand) Co., Ltd.  
129 Rama 9 Road, Huaykwang  
10310 BangkokVerical®  
Version 6.5

Page 4 | 4



Certificate Number

CWS-035-67

## CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

**MEASUREMENT ITEM** : Cup anemometer  
**MANUFACTURER** : Novalyne  
**MODEL/TYPE** : Sensor: WSO-Q2F  
Data logger: 200-WS-25LB  
**SERIAL NUMBER** : Sensor: WSO-AS379  
Data logger: AS379  
**ID NUMBER** : BKK\_F50919  
**CONDITION AS-RECEIVED** : Used item  
**CUSTOMER** : ALS laboratory group (Thailand) Co., Ltd.  
104 Phatthanakan 40, Phatthanakan Rd, Khwaeng Suan Luang,  
Khet Suan Luang, Bangkok 10250 Thailand.

**RECEIVED DATE** : 16 Aug 2024  
**MEASUREMENT DATE** : 16 Aug 2024  
**ISSUE DATE** : 16 Aug 2024

**ENVIRONMENTAL CONDITIONS:**  
Ambient condition in the laboratory are as follows:  
Temperature : 23.0 ± 3.0 °C  
Relative Humidity : 55.0 ± 15.0 %RH  
Atmospheric Pressure : 1010 ± 10 hPa

**PLACE OF CALIBRATION** : Effel-type wind tunnel of Jiranatee Associates Co., Ltd.

**CALIBRATION CONDITIONS** : Wind tunnel cross-section area<sup>1</sup> 900 cm<sup>2</sup>  
Wind direction frontal area<sup>2</sup> 100 cm<sup>2</sup>  
Diameter of mounting pipe<sup>3</sup> mm  
Blockage ratio of test object<sup>4</sup> 0.311 [-]

**Preconditioning** : 24 hours at ambient conditions.  
**Measurement Condition** : The average values during measurement are (23.3) °C, (43.8) %RH and (1006.2) hPa.

**TABULATION OF RESULTS:**  
The table on next page give the measured values.

Calibrated by:  
☒ Mr. Sorawit Thachakul  
☐ Miss Jitraporn Lertbongphol



Approved signatory:

Mr. Parinya Booncharoen  
Calibration Department Manager

REVIEW BY: *Parinya Booncharoen*  
APPROVED BY: *Parinya Booncharoen*  
NEXT CAL DATE: 26/12/26

**Remarks:**  
<sup>1</sup> Nozzle cross-section area of the wind tunnel  
<sup>2</sup> Projected cross-section area of the tested object include mounting pipe  
<sup>3</sup> Diameter of mounting pipe  
<sup>4</sup> Ratio 1 to 1

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

Page 2 of 2 Pages

### MEASUREMENT RESULTS<sup>1</sup>

The Cup anemometer, Unit Under Calibration (UUC) was exercise at 10 m/s for 5 minutes prior to calibration being performed. The standard air velocity 0.5 m/s to 5 m/s was calculated by a standard air velocity transducer which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section and the standard air velocity 5 m/s to 30 m/s was calculated by a pitot tube with precision differential pressure meter which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section. UUC was mounted on a round vertical tube of the lower plate at center of test section. The calibration was carried out under both rising and falling air velocity in the range of 1 m/s to 16 m/s at calibration interval of 1 m/s. The results of calibration and associated measurement uncertainties are reported in the table below.

$V_{ref}$ [m/s]	Temp. wind tunnel [°C]	Temp. room [°C]	$V_{unc}$ [m/s]	Error [m/s]	$U$ (k=2) [m/s]
1.001	23.26	23.30	0.9	-0.1	0.31
2.069	23.40	23.30	1.9	-0.2	0.31
2.954	23.30	23.30	2.9	-0.1	0.31
4.068	23.30	23.30	3.9	-0.2	0.31
4.97	23.16	23.30	5.0	0.0	0.31
6.00	23.14	23.30	6.0	0.0	0.31
7.02	23.00	23.30	7.1	0.1	0.31
7.97	23.30	23.30	8.1	0.1	0.31
8.98	23.04	23.30	9.1	0.1	0.31
9.97	23.30	23.30	10.1	0.1	0.31
10.93	23.10	23.30	11.2	0.2	0.31
12.01	23.20	23.30	12.2	0.2	0.31
12.95	23.20	23.30	13.2	0.2	0.31
14.07	23.20	23.30	14.2	0.1	0.31
15.00	23.20	23.30	15.2	0.2	0.31
15.99	23.20	23.30	16.2	0.2	0.35

**Remark:**

<sup>1</sup> Calibration results only count for the tested circumstances and environmental conditions during which calibration took place

<sup>2</sup> Velocity of standard

<sup>3</sup> Velocity of Unit Under Calibration

**PHOTO OF CALIBRATION SET-UP**



Calibration set-up of the Cup anemometer calibration in the wind tunnel of Jiranatee Associates Co., Ltd. The Cup anemometer shown may differ from the calibrated one. Remark: The proportion of the set-up is not true to scale due to imaging geometry.

\*\*\*End of Certificate of Calibration\*\*\*  
J NAC  
HIRANATEE ASSOCIATES CO., LTD.

Certificate Number

CWD-035-67

## CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

**MEASUREMENT ITEM** : Wind Direction Sensor  
**MANUFACTURER** : Novalyne  
**MODEL/TYPE** : Sensor: WSO-Q2F  
Data logger: 200-WS-25LB  
**SERIAL NUMBER** : Sensor: WSO-AS379  
Data logger: AS379  
**ID NUMBER** : BKK\_F50919  
**CONDITION AS-RECEIVED** : Used item  
**CUSTOMER** : ALS laboratory group (Thailand) Co., Ltd.  
104 Phatthanakan 40, Phatthanakan Rd, Khwaeng Suan Luang,  
Khet Suan Luang, Bangkok 10250 Thailand.

**RECEIVED DATE** : 16 Aug 2024  
**MEASUREMENT DATE** : 16 Aug 2024  
**ISSUE DATE** : 16 Aug 2024

**ENVIRONMENTAL CONDITIONS:**  
Ambient condition in the laboratory are as follows:  
Temperature : 23.0 ± 3.0 °C  
Relative Humidity : 55.0 ± 15.0 %RH  
Atmospheric Pressure : 1010 ± 10 hPa

**PLACE OF CALIBRATION** : Effel-type wind tunnel of Jiranatee Associates Co., Ltd.

**CALIBRATION CONDITION** : Wind tunnel cross-section area<sup>1</sup> 900 cm<sup>2</sup>  
Wind direction frontal area<sup>2</sup> 129 cm<sup>2</sup>  
Diameter of mounting pipe<sup>3</sup> mm  
Blockage ratio of test object<sup>4</sup> 0.143 [-]

**Preconditioning** : 24 hours at ambient conditions.  
**Measurement Condition** : The average values during measurement are (23.4) °C, (42.5) %RH and (1008.4) hPa.

**TABULATION OF RESULTS:**  
The table on next page give the measured values.

Calibrated by:  
☒ Mr. Sorawit Thachakul  
☐ Miss Jitraporn Lertbongphol



Approved signatory:

Mr. Parinya Booncharoen  
Calibration Department Manager

**Remarks:**  
<sup>1</sup> Nozzle cross-section area of the wind tunnel  
<sup>2</sup> Projected cross-section area of the tested object include mounting pipe  
<sup>3</sup> Diameter of mounting pipe  
<sup>4</sup> Ratio 1 to 1

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Certificate Number

CWD-035-67

Page 2 of 2 Pages

### MEASUREMENT RESULTS<sup>1</sup>

The wind direction sensor was calibrated against standard rotary encoder by comparison method. During calibration, the measurement was carried out at 45° intervals in clockwise and counterclockwise directions after offset adjustment has been made. The flow speed of wind tunnel (usually 5 m/s) is kept constant while the sensor is rotated around its vertical axis. The results of calibration and associated measurement uncertainties are reported in the table below.

Air speed m/s	D' <sub>unc</sub> Degree (°)	D' <sub>unc</sub> Degree (°)	Error Degree (°)	$U$ (k=2) Degree (°)
	0	0	0	0.80
	45.000	42	-3	0.80
	90.000	87	-3	0.80
5.03	135.000	133	-2	0.80
	180.000	181	1	0.80
	225.000	229	4	0.80
	270.000	275	5	0.80
	315.000	320	5	0.80

**Remark:**

<sup>1</sup> Calibration results only count for the tested circumstances and environmental conditions during which calibration took place

<sup>2</sup> Direction of standard

<sup>3</sup> Direction of Unit Under Calibration

\*\*\*End of Certificate of Calibration\*\*\*

J NAC  
HIRANATEE ASSOCIATES CO., LTD.

SITHIPORN ASSOCIATES CO., LTD.  
CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbunru, Bangplud, Bangkok, 10700 Thailand  
Tel. +66 2433 8331 Email : calibration@sithiporn.com



Cert. No. : ACC24055  
Pages : 1 of 3

## Calibration Certificate

Equipment : SOUND CALIBRATOR  
Manufacturer : RION  
Model : NC-74  
Serial No.: 34178124  
ID No.: RYG\_FS0216

REVIEW BY *S.T.S*  
APPROVED BY *[Signature]*  
NEXT CAL DATE 22-Oct-25

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 : 18 OCTOBER 2024  
Calibration Date : 22 OCTOBER 2024  
Date of Issue : 24 OCTOBER 2024

Calibrated by : Nathakorn Pisutpaisan

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

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CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbunru, Bangplud, Bangkok, 10700 Thailand  
Tel. +66 2433 8331 Email : calibration@sithiporn.com



Cert. No. : ACC24055  
Job No. : VC68AC0015  
Pages : 2 of 3

Calibration Procedure : CP-AC-03

### Calibration Method :

This equipment was calibrated by follow on IEC-60942-2003 Standard.

The sound pressure level, frequency and total distortion of the sound calibrator was measured using the reference microphone.

### Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL.BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL.BP 20/0267	15-FEB-25
Digital Multimeter	33461A	MY60024273	EEL.BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25
Audio Analyzer	AVR-3360A	V744B6069	EF-0009-24	09-FEB-25

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

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

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

*T. Petchur*

SITHIPORN ASSOCIATES CO., LTD.  
CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbunru, Bangplud, Bangkok, 10700 Thailand  
Tel. +66 2433 8331 Email : calibration@sithiporn.com



Cert. No. : ACC24055  
Job No. : VC68AC0015  
Pages : 3 of 3

### Result of calibration :

#### 1. Sound pressure level

Specified sound pressure level (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (dB)	Acceptance limit (dB)
94	94.19	0.19	0.14	0.40

#### 2. Frequency

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

#### 3. Total distortion

Measured value (%)	Uncertainty (%)	Acceptance limit (%)
1.82	0.10	3.0

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

End of Calibration Certificate

*T. Petchur*

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Tel. +66 2433 8331 Email : calibration@sithiporn.com



Cert. No. : ACL24421  
Pages : 1 of 8

## Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer : RION  
Model : NL-42A / Microphone UC-52 / Preamplifier NH-24  
Serial No.: 00623390 / 198637 / 26418  
ID No.: RYG\_FS0615

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 : 12 DECEMBER 2024  
Calibration Date : 23 - 24 DECEMBER 2024  
Date of Issue : 26 DECEMBER 2024

REVIEW BY *S.T.S*  
APPROVED BY *[Signature]*  
NEXT CAL DATE 23/ 12/ 25

Calibrated by : Nathakorn Pisutpaisan

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

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



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Tel. +66 2433 8331 Email : calibration@sithiphom.com



Cert. No. : ACL24421  
Job No. : VC68AC0051  
Pages : 2 of 8

Calibration Procedure : CP-AC-01

**Calibration Method :**

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

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

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

**Condition of this result of calibration :**

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL.BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL.BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL.BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

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

T. Petch.

**SITHIPORN ASSOCIATES CO., LTD.**  
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Cert. No. : ACL24421  
Job No. : VC68AC0051  
Pages : 3 of 8

**Summary of Measurement Result :**

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

T. Petch.

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Cert. No. : ACL24421  
Job No. : VC68AC0051  
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**Result of calibration :**

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	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	Weighting (dB)
A - weight	13.1
C - weight	19.5
Flat	24.8

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.5	0.5	0.5	± 1.5
1000	0.2	0.2	0.2	± 1.0
8000	0.0	0.0	0.0	±5.0

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Cert. No. : ACL24421  
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4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	-0.1	-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	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

T. Petch.

**SITHIPORN ASSOCIATES CO., LTD.**  
**CALIBRATION LABORATORY**

451-451/1 Sirinthorn Road, Bangbunru, Bangplud, Bangkok, 10700 Thailand  
Tel. +66 2433 8331 Email : calibration@sithiphom.com

**SITHIPORN**  
associates



Cert. No. : ACL24421  
Job No. : VC68AC0051  
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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	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	27.9	-0.1	± 1.1
27.0	27.0	0.0	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

*T. Petchur*

**SITHIPORN ASSOCIATES CO., LTD.**  
**CALIBRATION LABORATORY**

451-451/1 Sirinthorn Road, Bangbunru, Bangplud, Bangkok, 10700 Thailand  
Tel. +66 2433 8331 Email : calibration@sithiphom.com

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Cert. No. : ACL24421  
Job No. : VC68AC0051  
Pages : 7 of 8

**8. Level linearity including the level range control**

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.0	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

*T. Petchur*

**SITHIPORN ASSOCIATES CO., LTD.**  
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Cert. No. : ACL24421  
Job No. : VC68AC0051  
Pages : 8 of 8

**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L <sub>peak</sub> (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

**11. Overload indication**

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

**12. High level stability**

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

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

End of Calibration Certificate

*T. Petchur*

**SITHIPORN ASSOCIATES CO., LTD.**  
**CALIBRATION LABORATORY**

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Cert. No. : ACL24418  
Pages : 1 of 8

**Calibration Certificate**

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-42A / Microphone UC-52 / Preamplifier NH-24  
**Serial No.:** 00623387 / 198634 / 26415  
**ID No.:** RYG FS0612

**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 :** 12 DECEMBER 2024  
**Calibration Date :** 23 - 24 DECEMBER 2024  
**Date of Issue :** 26 DECEMBER 2024

**Calibrated by :** Nathakorn Pisutpaisan

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

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



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Cert. No. : ACL24418  
Job No. : VC68AC0051  
Pages : 2 of 8

Calibration Procedure : CP-AC-01

**Calibration Method :**

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

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

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

**Condition of this result of calibration :**

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL_BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL_BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL_BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KA1	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

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

*T. Petch*

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Cert. No. : ACL24418  
Job No. : VC68AC0051  
Pages : 3 of 8

**Summary of Measurement Result :**

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

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Cert. No. : ACL24418  
Job No. : VC68AC0051  
Page : 4 of 8

**Result of calibration :**

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.6

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

Frequency Weighting	Weighting (dB)
A - weight	11.6
C - weight	18.0
Flat	24.0

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.5	0.5	0.5	± 1.5
1000	0.2	0.2	0.2	± 1.0
8000	-0.7	-0.6	-0.6	±5.0

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Job No. : VC68AC0051  
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

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Job No. : VC68AC0051  
Pages : 6 of 8

**7. Level linearity on the reference level range**

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	53.9	-0.1	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	38.9	-0.1	± 1.1
34.0	33.9	-0.1	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.0	0.0	± 1.1
26.0	26.0	0.0	± 1.1
25.0	25.1	0.1	± 1.1

*T. Petchur*

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Pages : 7 of 8

**8. Level linearity including the level range control**

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.0	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	128.1	0.1	±1.0

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Job No. : VC68AC0051  
Pages : 8 of 8

**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L <sub>peak</sub> (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.3	-0.1	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

**11. Overload indication**

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

**12. High level stability**

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

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

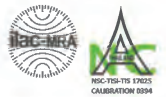
End of Calibration Certificate

*T. Petchur*

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Cert. No. : ACL25110  
Pages : 1 of 8

**Calibration Certificate**

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-42 / Microphone UC-52 / Preamplifier NH-24  
**Serial No.:** 00900074 / 188467 / 01736  
**ID No.:** RYG\_FS0495

**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 :** 14 JANUARY 2025  
**Calibration Date :** 27-29 JANUARY 2025  
**Date of Issue :** 30 JANUARY 2025

**Calibrated by :** Nathakorn Pisutpaisan

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

REVIEW BY *Spt S*  
APPROVED BY *T. Petchur*  
NEXT CAL DATE 26/ 01/ 2026

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Cert. No. : ACL25110  
Job No. : VC68AC0064  
Pages : 2 of 8

Calibration Procedure : CP-AC-01

#### Calibration Method :

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

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

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

#### Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL-BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL-BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL-BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KA	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

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

7. Peth.

Cert. No. : ACL25110  
Job No. : VC68AC0064  
Pages : 3 of 8

#### Summary of Measurement Result :

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

7. Peth.

Cert. No. : ACL25110  
Job No. : VC68AC0064  
Page : 4 of 8

#### Result of calibration :

##### 1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

##### 2. Self-generated noise

###### 2.1 Normal test

Measured Value (dB)
14.6

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

Frequency Weighting	Weighting (dB)
A - weight	12.0
C - weight	17.7
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	0.3	0.3	0.3	± 5.0

7. Peth.

Cert. No. : ACL25110  
Job No. : VC68AC0064  
Pages : 5 of 8

##### 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	-0.1	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	-0.1	±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	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

###### 5.2 Time weighting at 1 kHz

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

##### 6. Long - term stability

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

7. Peth.



Cert. No. : ACL25110  
Job No. : VC68AC0064  
Pages : 6 of 8

## 7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.1	0.1	± 1.1
134.0	134.1	0.1	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.1	0.1	± 1.1
114.0	114.1	0.1	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.1	0.1	± 1.1
99.0	99.1	0.1	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.1	0.1	± 1.1
28.0	28.1	0.1	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.2	0.2	± 1.1
25.0	25.2	0.2	± 1.1

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Cert. No. : ACL25110  
Job No. : VC68AC0064  
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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	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.1	0.1	±1.1

## 9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	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

T. Petchur

Cert. No. : ACL25110  
Job No. : VC68AC0064  
Pages : 8 of 8

## 10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L <sub>peak</sub> (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

## 11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.5	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. Petchur

451-451/1 Sirinthorn Road, Bangbunru, Bangplad, Bangkok, 10700 Thailand  
Tel. +66 2433 8331 Email : calibration@sithiporn.comCert. No. : ACL24420  
Pages : 1 of 8

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-42A / Microphone UC-52 / Preamplifier NH-24  
**Serial No.:** 00623389 / 198636 / 26417  
**ID No.:** RYG\_FS0614

**Condition As Found :** GOOD

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

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

**Received Date :** 12 DECEMBER 2024  
**Calibration Date :** 23 - 24 DECEMBER 2024  
**Date of Issue :** 26 DECEMBER 2024

Calibrated by :

Nathakorn Pisutpaisan

Approved by :

T. Petchur  
( Thanakul Petchurai )

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

**SITHIPORN ASSOCIATES CO., LTD.**  
**CALIBRATION LABORATORY**

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Tel. +66 2433 8331 Email : calibration@sithiphorn.com

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Cert. No. : ACL24420  
Job No. : VC68AC0051  
Pages : 2 of 8

Calibration Procedure : CP-AC-01

**Calibration Method :**

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

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

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

**Condition of this result of calibration :**

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL_BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL_BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL_BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

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

T. Petch

**SITHIPORN ASSOCIATES CO., LTD.**  
**CALIBRATION LABORATORY**

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Cert. No. : ACL24420  
Job No. : VC68AC0051  
Pages : 3 of 8

**Summary of Measurement Result :**

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

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Cert. No. : ACL24420  
Job No. : VC68AC0051  
Page : 4 of 8

**Result of calibration :**

1. Absolute sensitivity

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value ( dB )
13.8

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

Frequency Weighting	Weighting ( dB )
A - weight	9.9
C - weight	16.8
Flat	22.7

3. Acoustical signal tests of frequency weightings

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

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.4	0.4	± 1.5
1000	0.2	0.2	0.2	± 1.0
8000	0.4	0.5	0.5	± 5.0

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Job No. : VC68AC0051  
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

T. Petch

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Cert. No. : ACL24420  
Job No. : VC68AC0051  
Pages : 6 of 8

## 7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.0	0.0	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	25.0	0.0	± 1.1

T. Petch

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Cert. No. : ACL24420  
Job No. : VC68AC0051  
Pages : 7 of 8

## 8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.8	-0.2	±1.1

## 9. Tone burst response

Time	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

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Cert. No. : ACL24420  
Job No. : VC68AC0051  
Pages : 8 of 8

## 10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L <sub>peak</sub> (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	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	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

## 11. Overload indication

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

## 12. High level stability

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

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

End of Calibration Certificate

T. Petch

INNOVATIVE INSTRUMENT CALIBRATION LAB  
INNOVATIVE INSTRUMENT CO., LTD. HEAD OFFICE  
7/19 MOO 13, SOI SUTINAKORN 11 TAMBON BANG KAE, AMPHOE BANG PHI SAMUT PRANANG PROVINCE 10540 THAILAND  
TEL: (660) 2116-5800-1 FAX: (660) 2116-7140



## Certificate of Calibration

### Customer

Name : ALS Laboratory Group Thailand Co., Ltd.  
Address : 104 Soi Phatthanakan 40, Phatthanakan Road, Suan Luang, Bangkok 10250

Certificate No : 25-ACT-010  
Request No : Req-2025-0091

### Unit Under Calibration Details

Measurement item : Acoustic Calibrator Class : 1  
Manufacturer : RION Range : 94 dB / 1000 Hz  
Model : NC-74 Instrument Status : Used  
Serial Number : 34178121  
ID : RYG\_FS0213

### Calibration Environment and Details

Temperature : ( 23 ± 2 °C )  
Humidity : ( 50 ± 20 %RH )  
Barometric Pressure : ( 1013 ± 10.0 hPa )  
Received Date : 15 January 2025  
Calibration Date : 16 January 2025  
Location of Calibration : LAB 1 Acoustic  
Calibration Procedure : In-house method CP-ACT-02 based on IEC 60942:2017 Electroacoustics - Sound calibrators

REVIEW BY : *Manish*  
APPROVED BY : *[Signature]*  
NEXT CAL DATE : 16/01/26

Reference Standard	Model	Serial Number	Traceable	Due Calibration
Sound Calibrator	SV 35A	58079	EET	12 June 2025
THD Multimeter	2015	1047765	NIMT	16 January 2025

### Traceability

: This certificate provides traceability of measurement to recognized national standard, and to the realization of the international System of Units (SI).

### Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %.

Calibrated By : *Mr. Noppadon Luangart*  
Service Calibration Engineer

Approved By : *Mr. Pacit Mathavorn*  
Calibration Engineer Supervisor

Issue Date : 16 January 2025



Certificate No : 25-ACT-010

Request No : Req-2025-0091

Sound pressure level

Calibration Results : Without Adjustment

Calibration Range (dB)	Without Adjustment (dB)		Adjustment (dB)		Uncertainty ( $\pm$ dB)	Acceptance limit Class 1 ( $\pm$ dB)	Result
	Measured	Deviated value	Measured	Deviated value			
94 dB / 1000 Hz	94.11	0.11	-	-	0.13	0.25	Pass

Frequency of Sound pressure level

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty ( $\pm$ %)	Acceptance limit Class 1 ( $\pm$ %)	Result
	Measured (Hz)	Deviated	Measured (Hz)	Deviated			
94 dB / 1000 Hz	1000.00	0.00	-	-	0.01	0.70	Pass

Total Harmonic Distortion plus Noise of Sound pressure level (THD+N %)

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty ( $\pm$ %)	Acceptance limit Class 1 ( $\pm$ %)	Result
	Measured (%)		Measured (%)				
94 dB / 1000 Hz	1.21		-		0.40	2.5	Pass

Note :

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

- Acceptance limit was IEC60942:2017 Class 1

- The calibration results exclude the calibrator pressure correction

- The calibration results exclude the microphone volume correction

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-ACT-02 Rev.03 Issue date 5/6/24

Certificate No : 25-ACT-010

Request No : Req-2025-0091

Decision Rule for Statements of Conformity

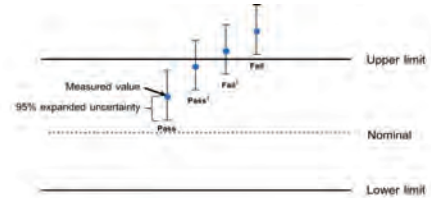
The standard decision rule employed for the statements of conformity to each calibration result will be applied using ILAC-G8:09/2019; Guidelines on the Reporting of Compliance with Specification as following Fig. and statements

Pass – The measurement result plus the expanded uncertainty with a 95% coverage probability were within the limit.

Pass<sup>1</sup> – The measurement result was within the limit. However, a portion of the expanded uncertainty of measurement at 95% exceeds the limit.

Fail<sup>1</sup> – The measurement result was out of the limit. However, a portion of the expanded uncertainty of measurement at 95% is within the limit.

Fail – The measurement result plus the expanded uncertainty with a 95% coverage probability were outside the limit.



End of Calibration

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-ACT-02 Rev.03 Issue date 5/6/24

SITHIPORN ASSOCIATES CO., LTD.  
CALIBRATION LABORATORY

45/-45/1 Sirinthorn Road, Bangbunru, Bangpuat, Bangkok, 10700 Thailand  
Tel: +66 2433 8331 Email : calibration@sithiporn.com



Cert. No. : ACL24305  
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer : RION  
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24  
Serial No.: 00873109 / 171842 / 73485  
ID No.: RYG\_FS0384

Condition As Found : GOOD

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

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

Received Date : 23 SEPTEMBER 2024  
Calibration Date : 09 OCTOBER 2024  
Date of Issue : 09 OCTOBER 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by :

T. Petchu-  
( 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 CO., LTD.  
CALIBRATION LABORATORY

45/-45/1 Sirinthorn Road, Bangbunru, Bangpuat, Bangkok, 10700 Thailand  
Tel: +66 2433 8331 Email : calibration@sithiporn.com



Cert. No. : ACL24305  
Job No. : VC67AC0164  
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

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

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL_BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL_BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL_BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

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

T. Petchu-  
( Thanakul Petchurai )



Cert. No. : ACL24305  
Job No. : VC67AC0164  
Pages : 3 of 8

**Summary of Measurement Result :**

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

T. Petch.

Cert. No. : ACL24305  
Job No. : VC67AC0164  
Page : 4 of 8

**Result of calibration :**

**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

**2. Self-generated noise**

**2.1 Normal test**

Measured Value (dB)
16.1

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

Frequency Weighting	Weighting (dB)
A - weight	13.1
C - weight	19.8
Flat	25.1

**3. Acoustical signal tests of frequency weightings**

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.4	0.5	0.5	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	-1.4	-1.3	-1.3	± 5.0

T. Petch.

Cert. No. : ACL24305  
Job No. : VC67AC0164  
Pages : 5 of 8

**4. Electrical signal tests of frequency weightings**

Weighting network response with relative to 1 kHz

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

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

**5.1 Frequency weightings at 1 kHz**

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

**5.2 Time weighting at 1 kHz**

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

**6. Long - term stability**

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

T. Petch.

Cert. No. : ACL24305  
Job No. : VC67AC0164  
Pages : 6 of 8

**7. Level linearity on the reference level range**

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.1	0.1	± 1.1
27.0	27.2	0.2	± 1.1
26.0	26.2	0.2	± 1.1
25.0	25.2	0.2	± 1.1

T. Petch.



Cert. No. : ACL24305  
Job No. : VC67AC0164  
Pages : 7 of 8

## 8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	30.0	30.1	0.1	±1.1

## 9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

Cert. No. : ACL24305  
Job No. : VC67AC0164  
Pages : 8 of 8

## 10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L <sub>peak</sub> (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	136.2	-0.2	±3.0

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

## 11. Overload indication

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

## 12. High level stability

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

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

End of Calibration Certificate

Cert. No. : ACL24264  
Pages : 1 of 8

## Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer : RION  
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24  
Serial No.: 00472132 / 169445 / 72466  
ID No.: RYG\_FS0304

Condition As Found : GOOD

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

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

Received Date : 09 AUGUST 2024  
Calibration Date : 30 AUGUST 2024  
Date of Issue : 03 SEPTEMBER 2024



Calibrated by : Nathakorn Pisutpaisan

Approved by :

*T. Petchur*  
( Thanakul Petchur )

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Cert. No. : ACL24264  
Job No. : VC67AC0140  
Pages : 2 of 8

Calibration Procedure : CP-AC-01

## Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM). The SLM had tests in Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

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

## Condition of this result of calibration :

## 1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL-BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL-BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL-BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAJ	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

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

*T. Petchur*



Cert. No. : ACL24264  
Job No. : VC67AC0140  
Pages : 3 of 8

**Summary of Measurement Result :**

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

*T. Petch*

Cert. No. : ACL24264  
Job No. : VC67AC0140  
Page : 4 of 8

**Result of calibration :**

**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

**2. Self-generated noise**

**2.1 Normal test**

Measured Value (dB)
16.6

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

Frequency Weighting	Weighting (dB)
A - weight	11.6
C - weight	18.0
Flat	23.4

**3. Acoustical signal tests of frequency weightings**

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.4	0.4	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	-0.8	-0.7	-0.8	± 5.0

*T. Petch*

Cert. No. : ACL24264  
Job No. : VC67AC0140  
Pages : 5 of 8

**4. Electrical signal tests of frequency weightings**

Weighting network response with relative to 1 kHz.

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

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

**5.1 Frequency weightings at 1 kHz**

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

**5.2 Time weighting at 1 kHz**

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

**6. Long - term stability**

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

*T. Petch*

Cert. No. : ACL24264  
Job No. : VC67AC0140  
Pages : 6 of 8

**7. Level linearity on the reference level range**

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.1	0.1	± 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	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.0	0.0	± 1.1
26.0	26.0	0.0	± 1.1
25.0	24.9	-0.1	± 1.1

*T. Petch*



Cert. No. : ACL24264  
Job No. : VC67AC0140  
Pages : 7 of 8

**8. Level linearity including the level range control**

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	30.0	29.8	-0.2	±1.1

**9. Tone burst response**

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

*T. Petch*

Cert. No. : ACL24264  
Job No. : VC67AC0140  
Pages : 8 of 8

**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	135.6	-0.8	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.1	0.1	±2.0
Positive half cycle	135.4	135.3	-0.1	±2.0
Negative half cycle	135.4	135.3	-0.1	±2.0

**11. Overload indication**

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.8	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

*T. Petch*

Cert. No. : ACL24260  
Pages : 1 of 8

**Calibration Certificate**

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-42 / Microphone UC-52 / Preamplifier NH-24  
**Serial No.:** 00472130 / 169816 / 72464  
**ID No.:** RYG\_FS0303

**Condition As Found :** GOOD

**Customer :** ALS LABORATORY GROUP (THAILAND) CO., LTD.  
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,  
KHUWAENG 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 :** 09 AUGUST 2024  
**Calibration Date :** 23 AUGUST 2024  
**Date of Issue :** 26 AUGUST 2024



Calibrated by : Nathakorn Pisutpaisan

Approved by :

*T. Petch*  
( Thanakul Petchurai )

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*T. Petch*

Cert. No. : ACL24260  
Job No. : VC67AC0140  
Pages : 2 of 8

**Calibration Procedure :** CP-AC-01

**Calibration Method :**

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM). The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

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

**Condition of this result of calibration :**

**1. Reference Standard Instruments :**

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL-BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL-BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL-BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KA1	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

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



**SITHIPORN ASSOCIATES CO., LTD.**  
**CALIBRATION LABORATORY**

451-451/1 Sirinthorn Road, Bangbunru, Bangplud, Bangkok, 10700 Thailand  
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Cert. No. : ACL24260  
Job No. : VC67AC0140  
Pages : 3 of 8

**Summary of Measurement Result :**

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

*T. Petch*

**SITHIPORN ASSOCIATES CO., LTD.**  
**CALIBRATION LABORATORY**

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Cert. No. : ACL24260  
Job No. : VC67AC0140  
Page : 4 of 8

**Result of calibration :**

**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

**2. Self-generated noise**

**2.1 Normal test**

Measured Value (dB)
14.50000003

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

Frequency Weighting	Weighting (dB)
A - weight	7.8
C - weight	14.8
Flat	20.5

**3. Acoustical signal tests of frequency weightings**

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	1.3	1.4	1.4	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	-4.1	-4.0	-4.0	±5.0

*T. Petch*

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Cert. No. : ACL24260  
Job No. : VC67AC0140  
Pages : 5 of 8

**4. Electrical signal tests of frequency weightings**

Weighting network response with relative to 1 kHz.

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

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

**5.1 Frequency weightings at 1 kHz**

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

**5.2 Time weighting at 1 kHz**

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

**6. Long - term stability**

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

*T. Petch*

**SITHIPORN ASSOCIATES CO., LTD.**  
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Cert. No. : ACL24260  
Job No. : VC67AC0140  
Pages : 6 of 8

**7. Level linearity on the reference level range**

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	135.9	-0.1	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	132.9	-0.1	± 1.1
132.0	131.9	-0.1	± 1.1
131.0	130.9	-0.1	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.1	0.1	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.0	0.0	± 1.1

*T. Petch*



Cert. No. : ACL24260  
Job No. : VC67AC0140  
Pages : 7 of 8

**8. Level linearity including the level range control**

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.1	0.1	±1.1

**9. Tone burst response**

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

*T. Petchur*

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**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L <sub>peak</sub> (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

**11. Overload indication**

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.5	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. Petchur*

Cert. No. : ACL24265  
Pages : 1 of 8

**Calibration Certificate**

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-42 / Microphone UC-52 / Preamplifier NH-24  
**Serial No.:** 00572561 / 170398 / 72899  
**ID No.:** RYG\_FS0300

**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 :** 09 AUGUST 2024  
**Calibration Date :** 30 AUGUST 2024  
**Date of Issue :** 03 SEPTEMBER 2024

REVIEW BY *Nathakorn P.*  
APPROVED BY *T. Petchur*  
NEXT CAL. DATE *30/8/25*

Calibrated by : Nathakorn Pisurpaian

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

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

Cert. No. : ACL24265  
Job No. : VC67AC0140  
Pages : 2 of 8

**Calibration Procedure :** CP-AC-01

**Calibration Method :**

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

**Condition of this result of calibration :**

**1. Reference Standard Instruments :**

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL-BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL-BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL-BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

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

*T. Petchur*



**SITHIPORN ASSOCIATES CO., LTD.**  
**CALIBRATION LABORATORY**

451-451/ Sirinthorn Road, Bangbunmu, Bangkok, 10700 Thailand  
Tel: +66 2433 8331 Email: calibration@sithiporn.com



Cert. No. : ACL24265  
Job No. : VC67AC0140  
Pages : 3 of 8

**Summary of Measurement Result :**

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

*T. Petch.*

**SITHIPORN ASSOCIATES CO., LTD.**  
**CALIBRATION LABORATORY**

451-451/ Sirinthorn Road, Bangbunmu, Bangkok, 10700 Thailand  
Tel: +66 2433 8331 Email: calibration@sithiporn.com



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**Result of calibration :**

**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

**2. Self-generated noise**

**2.1 Nominal test**

Measured Value (dB)
17.7

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

Frequency Weighting	Weighting (dB)
A - weight	16.3
C - weight	20.6
Flat	26.4

**3. Acoustical signal tests of frequency weightings**

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.2	0.3	0.2	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	1.1	1.2	1.2	±5.0

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**SITHIPORN ASSOCIATES CO., LTD.**  
**CALIBRATION LABORATORY**

451-451/ Sirinthorn Road, Bangbunmu, Bangkok, 10700 Thailand  
Tel: +66 2433 8331 Email: calibration@sithiporn.com



Cert. No. : ACL24265  
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**4. Electrical signal tests of frequency weightings**

Weighting network response with relative to 1 kHz.

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

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

**5.1 Frequency weightings at 1 kHz**

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

**5.2 Time weighting at 1 kHz**

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

**6. Long - term stability**

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

*T. Petch.*

**SITHIPORN ASSOCIATES CO., LTD.**  
**CALIBRATION LABORATORY**

451-451/ Sirinthorn Road, Bangbunmu, Bangkok, 10700 Thailand  
Tel: +66 2433 8331 Email: calibration@sithiporn.com



Cert. No. : ACL24265  
Job No. : VC67AC0140  
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**7. Level linearity on the reference level range**

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	53.9	-0.1	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	38.9	-0.1	± 1.1
34.0	34.0	0.0	± 1.1
30.0	29.9	-0.1	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	27.0	0.0	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.1	0.1	± 1.1

*T. Petch.*



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Job No. : VC67AC0140  
Pages : 7 of 8

## 8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	30.0	29.9	-0.1	±1.1

## 9. Tone burst response

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

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## 10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L <sub>peak</sub> (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	135.6	-0.8	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

## 11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.7	89.5	-0.2	±1.5

## 12. High level stability

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

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

End of Calibration Certificate

Cert. No. : ACL24304  
Pages : 1 of 8

## Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer : RION  
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24  
Serial No.: 00873057 / 171591 / 73333  
ID No.: RYG\_FS0381

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 : 23 SEPTEMBER 2024  
Calibration Date : 09 OCTOBER 2024  
Date of Issue : 09 OCTOBER 2024



Calibrated by : Nathakorn Pisutpaisan

Approved by :

[Signature]  
( Thanakul Petchuraj )

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Cert. No. : ACL24304  
Job No. : VC67AC0164  
Pages : 2 of 8

Calibration Procedure : CP-AC-01

## Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM). The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

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

## Condition of this result of calibration :

## 1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL-BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL-BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL-BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977990	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KA1	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

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



**Summary of Measurement Result :**

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

*T. Petch.*

**Result of calibration :**

**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

**2. Self-generated noise**

**2.1 Normal test**

Measured Value (dB)
16.7

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

Frequency Weighting	Weighting (dB)
A - weight	13.4
C - weight	19.3
Flat	25.0

**3. Acoustical signal tests of frequency weightings**

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.4	0.4	±1.5
1000	0.1	0.1	0.1	±1.0
8000	1.1	1.2	1.2	±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	0.0	0.0	0.0	±2.0
125	0.1	0.1	0.1	±1.5
250	0.1	0.0	0.0	±1.5
500	0.0	0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

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

**5.1 Frequency weightings at 1 kHz**

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

**5.2 Time weighting at 1 kHz**

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

**6. Long - term stability**

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

*T. Petch.*

**7. Level linearity on the reference level range**

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±1.1
136.0	136.0	0.0	±1.1
135.0	135.0	0.0	±1.1
134.0	134.0	0.0	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.0	0.0	±1.1
114.0	114.0	0.0	±1.1
109.0	109.0	0.0	±1.1
104.0	104.0	0.0	±1.1
99.0	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
30.0	30.1	0.1	±1.1
29.0	29.0	0.0	±1.1
28.0	28.1	0.1	±1.1
27.0	27.1	0.1	±1.1
26.0	26.2	0.2	±1.1
25.0	25.2	0.2	±1.1

*T. Petch.*



Cert. No. : ACL24304  
Job No. : VC67AC0164  
Pages : 7 of 8

## 8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	30.0	30.1	0.1	±1.1

## 9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

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## 10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	135.9	-0.5	±3.0

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

## 11. Overload indication

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

## 12. High level stability

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

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

End of Calibration Certificate

Cert. No. : ACL24283  
Pages : 1 of 8

## Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer : RJON  
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24  
Serial No. : 00472127 / 169440 / 72461  
ID No. : RYG\_FS0302

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 : 04 SEPTEMBER 2024  
Calibration Date : 19 SEPTEMBER 2024  
Date of Issue : 20 SEPTEMBER 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by :

*T. Petchur*  
( Thanakul Petchur )

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

Cert. No. : ACL24283  
Job No. : VC67AC0148  
Pages : 2 of 8

Calibration Procedure : CP-AC-01

## Calibration Method :

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

## Condition of this result of calibration :

## 1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL-BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL-BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL-BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

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



**Summary of Measurement Result :**

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

*T. Petch.*

**Result of calibration :**

**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

**2. Self-generated noise**

**2.1 Normal test**

Measured Value (dB)
17.5

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

Frequency Weighting	Weighting (dB)
A - weight	12.0
C - weight	18.2
Flat	24.1

**3. Acoustical signal tests of frequency weightings**

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.2	0.2	±1.5
1000	-0.2	-0.2	-0.2	±1.0
8000	-1.2	-1.1	-1.1	±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	0.0	-0.1	0.0	±2.0
125	0.1	0.1	0.0	±1.5
250	0.1	0.0	0.0	±1.5
500	0.0	0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.1	±2.0
4000	0.0	0.1	0.1	±3.0
8000	0.1	0.1	0.1	±5.0

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

**5.1 Frequency weightings at 1 kHz**

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

**5.2 Time weighting at 1 kHz**

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

**6. Long - term stability**

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

*T. Petch.*

**7. Level linearity on the reference level range**

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±1.1
136.0	136.0	0.0	±1.1
135.0	135.1	0.1	±1.1
134.0	134.1	0.1	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.1	0.1	±1.1
114.0	114.0	0.0	±1.1
109.0	109.0	0.0	±1.1
104.0	104.1	0.1	±1.1
99.0	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	33.9	-0.1	±1.1
30.0	29.9	-0.1	±1.1
29.0	28.9	-0.1	±1.1
28.0	27.9	-0.1	±1.1
27.0	26.9	-0.1	±1.1
26.0	25.9	-0.1	±1.1
25.0	24.9	-0.1	±1.1

*T. Petch.*



Cert. No. : ACL24283  
Job No. : VC67AC0148  
Pages : 7 of 8

## 8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	30.0	30.0	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	107.9	-0.1	1.5 ; -5.0
	200	800	127.6	127.5	-0.1	±1.0
SEL	0.25	1	99.0	98.8	-0.2	1.5 ; -5.0
	2	8	108.0	107.9	-0.1	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

Cert. No. : ACL24283  
Job No. : VC67AC0148  
Pages : 8 of 8

## 10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L <sub>peak</sub> (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	135.8	-0.6	±3.0

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

T. Retcha

T. Retcha



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## Certificate of Calibration

## Customer

Name : AIS Laboratory Group Thailand Co., Ltd.  
Address : 104 Soi Phantimakan 40, Phantimakan Road, Sino Luang, Bangkok 10250Certificate No : 25-SLM-114  
Request No : Req-2025-0603

## Unit Under Calibration Details

Measurement item : Sound Level Meter  
Manufacturer : RION  
Model : NL-42  
Serial Number : 01222723  
ID : RYG JS0022  
Resolution : 0.1 dB  
Microphone Class : 2  
Microphone Model : UC-52  
Microphone S/N : 143841  
Preamplifier Model : NH-24  
Preamplifier S/N : 22770  
Instrument Status : Used

## Calibration Environment and Details

Temperature : 23 °C ± 2 °C  
Humidity : 50 %RH ± 20 %RH  
Barometric Pressure : 1013 hPa ± 10 hPa  
Received Date : 6 March 2025  
Calibrated Date : 19 March 2025  
Calibration Procedure : In-house method CP-SLM-01, based on IEC 61672-3:2013 Electroacoustics - Sound level meters - Part 3: Periodic tests  
Location of Calibration : Lab Acoustic

## Reference Standard

Instrument	Brand	Model	S/N	Due calibration	Traceability
Standard Microphone	Briel & Kjaer	4192	2294985	25 June 2025	NIMT
Audio Generator	Synsok	Svan401	131	15 October 2025	WK Electric

## Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %.Calibrated By : Mr. Noppadol Liumgatt  
Service Calibration EngineerApproved By : Mr. Paeit Mathavon  
Calibration Engineer Supervisor  
Issue Date : 19 March 2025

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Certificate No : 25-SLM-114  
Request No : Req-2025-0603

## 1. Indication at the calibration check frequency

UUC Setting	Nominal Level	Before Adjust		After Adjust		UNCERTAINTY  (± dB)	Acceptance Limit  (± dB)	Result
PAST A / 30-130		UUC (dB)	ERR (dB)	UUC (dB)	ERR (dB)			
Calibrator Setting	94.06	(dB)	(dB)	(dB)	(dB)			
1000 Hz 94 dB	94.06	94.0	-0.06	94.1	-0.04	0.20	0.30	Pass

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand RION, Model NC-75, SN:35002736

## 2. Self-generated noise, Microphone installed

UUC Setting	Measured (dB)	UNCERTAINTY (± dB)
FAST / 30-130		
UUC Weighting		
A	15.4	0.10

## 3. Self-generated noise, Microphone replaced by the electrical input signal device

UUC Setting	Measured (dB)	UNCERTAINTY (± dB)
FAST / 30-130		
UUC Weighting		
A	12.2	0.10
C	16.6	0.10
Z	20.4	0.10

## 4. Acoustic signal test of frequency weightings (Without Windscreen)

UUC Setting	Deviation from various Frequency Weighting Response curve			UNCERTAINTY (± dB)	Acceptance Limit (± dB)	Result
	A	C	Z			
FAST / 30-130						
STD Setting	(dB)	(dB)	(dB)			
125 Hz	0.3	0.5	0.5	0.60	1.5	Pass
1000 Hz	0.0	0.0	0.0	0.60	1.0	Pass
4000 Hz	0.4	0.4	0.4	0.60	3.0	Pass
8000 Hz	-1.3	-1.3	-1.3	0.70	3.0	Pass



Certificate No : 25-SLM-114  
Request No : Req-2025-0603

#### 5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

Electroacoustic test of frequency weightings, weighting network response with reference to A-weighting		Deviation from various Frequency			UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)	Result
UIC Setting	FAST / 30-130	Weighting Response curve					
STD Setting		A (dB)	C (dB)	Z (dB)			
63 Hz	-0.1	0.0	0.0	0.20	2.0	Pass	
125 Hz	-0.1	0.0	0.0		1.5	Pass	
250 Hz	0.0	0.0	0.0		1.5	Pass	
500 Hz	0.0	0.1	0.0		1.5	Pass	
1000 Hz	0.0	0.0	0.0		1.0	Pass	
2000 Hz	0.0	0.1	0.0		2.0	Pass	
4000 Hz	0.0	0.0	0.0		3.0	Pass	
8000 Hz	0.1	0.1	0.0		5.0	Pass	
16000 Hz	-1.3	-1.3	0.0		$\pm 5$ INF	Pass	

#### 6. Frequency and time weightings at 1kHz

UUC Setting	STD	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)	Result
FAST / 30-130	REF	UUC	ERR			
UUC Weighting	(dB)	(dB)	(dB)			
A	114.00	114.0	0.0	0.20	0.20	Pass
C	114.00	114.0	0.0		0.20	Pass
Z	114.00	114.0	0.0		0.20	Pass

UUC Setting	STD	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)	Result
30-130 / A	REF	UUC	ERR			
UUC Time Response	(dB)	(dB)	(dB)			
Fast	114.00	114.0	0.0	0.20	0.10	Pass
Slow	114.00	114.0	0.0		0.10	Pass
Log	114.00	114.0	0.0		0.10	Pass

The result is valid only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-30-SLM-60 Rev.01 Issue date 19/02/2024

Certificate No : 25-SLM-114  
Request No : Req-2025-0603

#### 7. Long Term Stability

UUC Setting	Measured	UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)	Result
FAST / A / 30-130	UUC			
STD Setting	(dB)			
Initial	114.0			
Final	114.0			
Deviated	0.0			

#### 8. Level linearity on the reference level range

UUC Setting	Anticipated	Deviation		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)	Result
FAST / A / 30-130	REF	UUC	ERR			
STD dB	(dB)	(dB)	(dB)			
138.00	138	137.9	-0.1	0.30	1.1	Pass
134.00	134	134.0	0.0		1.1	Pass
129.00	129	129.0	0.0		1.1	Pass
124.00	124	124.0	0.0		1.1	Pass
119.00	119	119.0	0.0		1.1	Pass
114.00	114	114.0	0.0		1.1	Pass
109.00	109	109.0	0.0		1.1	Pass
104.00	104	104.0	0.0		1.1	Pass
99.00	99	99.0	0.0		1.1	Pass
94.00	94	94.0	0.0		1.1	Pass
89.00	89	89.0	0.0		1.1	Pass
84.00	84	84.0	0.0		1.1	Pass
79.00	79	79.0	0.0		1.1	Pass
74.00	74	74.0	0.0		1.1	Pass
69.00	69	69.0	0.0		1.1	Pass
64.00	64	64.0	0.0		1.1	Pass
59.00	59	59.0	0.0		1.1	Pass
54.00	54	54.0	0.0		1.1	Pass
49.00	49	49.0	0.0		1.1	Pass
44.00	44	44.0	0.0		1.1	Pass
39.00	39	39.0	0.0		1.1	Pass
34.00	34	34.0	0.0		1.1	Pass
29.00	29	29.1	0.1		1.1	Pass
24.00	24	24.0	0.0		1.1	Pass

The result is valid only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-30-SLM-60 Rev.01 Issue date 19/02/2024

Certificate No : 25-SLM-114  
Request No : Req-2025-0603

#### 9. Level linearity including the level range control

UUC Setting	STD	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)	Result
FAST / A	REF	UUC	ERR			
UUC Range	(dB)	(dB)	(dB)			
30-130	29.50	29.7	0.2	0.30	1.1	Pass
	114	114.0	0.0		1.1	Pass

#### 10. Tone burst response

UUC Setting	STD	Anticipated	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)	Result
A / 30-130	Timeburst	Ref	UUC	ERR			
UUC Time Response	(ms)	(dB)	(dB)	(dB)			
Fast	200	126.0	126.1	+0.1	0.20	1.0	Pass
	2	109.0	109.0	0.0		$\pm 1.0, \pm 2.5$	Pass
	0.25	100.0	99.9	-0.1		$\pm 1.5, \pm 5.0$	Pass
Slow	200	119.6	119.6	0.0		1.0	Pass
	2	100.0	100.0	0.0		$\pm 1.0, \pm 5.0$	Pass
	0.25	91.0	90.9	-0.1		$\pm 1.5, \pm 5.0$	Pass
SEL	200	120.0	120.0	0.0		1.0	Pass
	2	100.0	100.0	0.0		$\pm 1.0, \pm 2.5$	Pass
	0.25	91.0	90.9	-0.1		$\pm 1.5, \pm 5.0$	Pass

#### 11. Peak C Sound level

UUC Setting	Anticipated	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)	Result
FAST / C / 55-141	REF	UUC	ERR			
STD Setting	(dB)	(dB)	(dB)			
Complete cycle	136.4	135.8	-0.60	0.20	3.0	Pass
Positive half cycle	135.4	135.2	-0.20		2.0	Pass
Negative half cycle	135.4	135.2	-0.20		2.0	Pass

Certificate No : 25-SLM-114  
Request No : Req-2025-0603

#### 12. Overload indication

UUC Setting	Measured	UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)	Result
FAST / A / 30-130	UUC			
STD Setting	(dB)			
Positive one-half cycle	139.5			
Negative one-half cycle	139.4			
Deviated	0.1			

#### 13. High Level Stability

UUC Setting	Measured	UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)	Result
FAST / A / 30-130	UUC			
STD Setting	(dB)			
Initial	129.0			
Final	129.0			
Deviated	0.0			

#### Note :

Function	Maximum-permitted Uncertainty of measurement
1. Indication at the calibration check frequency	Not applicable
2. Self-generated noise, Microphone installed	Not applicable
3. Self-generated noise, Microphone replaced by the electrical input signal device	Not applicable
4. Acoustic signal test of frequency weightings at 10 Hz to 4 kHz	0.60 dB
4. Acoustic signal test of frequency weightings at <4 kHz to 10 kHz	0.70 dB
5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz	0.20 dB
6. Frequency and time weightings at 1kHz	0.20 dB
7. Long Term Stability	0.10 dB
8. Level linearity on the reference level range	0.30 dB
9. Level linearity including the level range control	0.30 dB
10. Tone burst response	0.30 dB
11. Peak C Sound level	0.35 dB
12. Overload indication	0.25 dB
13. High Level Stability	0.10 dB

\* Acceptance Limit and Maximum permitted Uncertainty was IEC 61672-1:2013

The result is valid only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-30-SLM-60 Rev.01 Issue date 19/02/2024

The result is valid only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-30-SLM-60 Rev.01 Issue date 19/02/2024

Certificate No : 25-SLM-114  
Request No : Req2025-0603

#### Decision Rule for Statements of Conformity

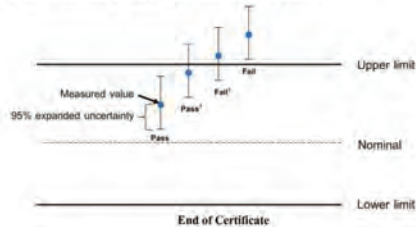
The standard decision rule employed for the statements of conformity to each calibration result will be applied using ILAC-08:2019; Guidelines on the Reporting of Compliance with Specification as following Fig. and statements

Pass - The measurement result plus the expanded uncertainty with a 95% coverage probability were within the limit.

Pass<sup>1</sup> - The measurement result was within the limit. However, a portion of the expanded uncertainty of measurement at 95% exceeds the limit.

Fail<sup>1</sup> - The measurement result was out of the limit. However, a portion of the expanded uncertainty of measurement at 95% is within the limit.

Fail - The measurement result plus the expanded uncertainty with a 95% coverage probability were outside the limit.



The results related only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

JM-200-SLM-01 Rev.01 Issue date 5/6/21

## SITHIPORN ASSOCIATES CO., LTD. CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbunru, Bangkok, Bangkok, 10700 Thailand  
Tel. +66 2433 8331 Email: calibration@sithiporn.com

Cert. No. : ACL25071  
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 :** 07 JANUARY 2025  
**Calibration Date :** 21 - 23 JANUARY 2025  
**Date of Issue :** 24 JANUARY 2025

REVIEW BY :   
APPROVED BY :   
NEXT CAL DATE : 21/01/2026

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

#### Condition of this result of calibration :

##### 1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL-BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL-BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL-BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

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



Cert. No. : ACL25071  
Job No. : VC68AC0059  
Pages : 3 of 8

#### Summary of Measurement Result :

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





Cert. No. : ACL25071  
Job No. : VC68AC0059  
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**Result of calibration :****1. Absolute sensitivity**

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.94)	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	Weighting ( dB )
A - weight	12.0
C - weight	18.3
Flat	24.0

**3. Acoustical signal tests of frequency weightings**

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

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	1.1	1.1	1.1	±5.0

Cert. No. : ACL25071  
Job No. : VC68AC0059  
Pages : 5 of 8

**4. Electrical signal tests of frequency weightings**

Weighting network response with relative to 1 kHz.

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

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

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

**5.2 Time weighting at 1 kHz**

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

**6. Long - term stability**

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

Cert. No. : ACL25071  
Job No. : VC68AC0059  
Pages : 6 of 8

**7. Level linearity on the reference level range**

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	78.9	-0.1	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	63.9	-0.1	± 1.1
59.0	59.0	0.0	± 1.1
54.0	53.9	-0.1	± 1.1
49.0	48.9	-0.1	± 1.1
44.0	43.9	-0.1	± 1.1
39.0	38.9	-0.1	± 1.1
34.0	33.9	-0.1	± 1.1
30.0	30.0	0.0	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.0	0.0	± 1.1
26.0	26.0	0.0	± 1.1
25.0	25.1	0.1	± 1.1

Cert. No. : ACL25071  
Job No. : VC68AC0059  
Pages : 7 of 8

**8. Level linearity including the level range control**

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	29.0	29.0	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	128.1	0.1	±1.0



Cert. No. : ACL25071  
Job No. : VC68AC0059  
Pages : 8 of 8

## 10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.3	-0.1	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

## 11. Overload indication

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

## 12. High level stability

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

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

End of Calibration Certificate

T. Petchur

Cert. No. : ACL25073  
Pages : 1 of 8

## Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer : RION  
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24  
Serial No.: 01222716 / 143832 / 22763  
ID No.: RYG\_FS0020

Condition As Found : GOOD

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

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

Received Date : 07 JANUARY 2025  
Calibration Date : 21 - 23 JANUARY 2025  
Date of Issue : 24 JANUARY 2025

REVIEW BY S.P.S.

APPROVED BY T. Petchur

NEXT CAL DATE, 21/ 01/ 2026

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petchur  
( Thanakul Petchurai )

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

Cert. No. : ACL25073  
Job No. : VC68AC0059  
Pages : 2 of 8

Calibration Procedure : CP-AC-01

## Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).  
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference  
Standard Instruments.

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

## Condition of this result of calibration :

## 1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL_BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL_BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL_BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

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

T. Petchur

Cert. No. : ACL25073  
Job No. : VC68AC0059  
Pages : 3 of 8

## Summary of Measurement Result :

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

T. Petchur

Cert. No. : ACL25073  
Job No. : VC68AC0059  
Page : 4 of 8

**Result of calibration :****1. Absolute sensitivity**

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.94)	93.9	0.0	±0.3

**2. Self-generated noise****2.1 Normal test**

Measured Value ( dB )
13.4

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

Frequency Weighting	Weighting ( dB )
A - weight	10.8
C - weight	16.7
Flat	22.6

**3. Acoustical signal tests of frequency weightings**

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

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	-0.2	-0.2	-0.2	± 1.5
1000	-0.6	-0.6	-0.6	± 1.0
8000	-1.0	-1.0	-1.0	±5.0

Cert. No. : ACL25073  
Job No. : VC68AC0059  
Pages : 5 of 8

**4. Electrical signal tests of frequency weightings**

Weighting network response with relative to 1 kHz.

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.2	0.2	0.3	±2.0
125	0.2	0.2	0.2	±1.5
250	0.1	0.1	0.1	±1.5
500	0.1	0.1	0.1	±1.5
1000	0.0	0.0	0.1	±1.0
2000	0.0	0.0	0.0	±2.0
4000	-0.1	-0.1	0.0	±3.0
8000	-0.1	0.0	0.0	±5.0

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

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

**5.2 Time weighting at 1 kHz**

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

**6. Long - term stability**

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

Cert. No. : ACL25073  
Job No. : VC68AC0059  
Pages : 6 of 8

**7. Level linearity on the reference level range**

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	140.0	3.0	± 1.1
136.0	140.0	4.0	± 1.1
135.0	140.0	5.0	± 1.1
134.0	140.0	6.0	± 1.1
133.0	133.1	0.1	± 1.1
132.0	132.1	0.1	± 1.1
131.0	131.1	0.1	± 1.1
129.0	129.1	0.1	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.1	0.1	± 1.1
114.0	114.1	0.1	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.1	0.1	± 1.1
99.0	99.1	0.1	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.1	0.1	± 1.1
29.0	29.1	0.1	± 1.1
28.0	28.2	0.2	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.2	0.2	± 1.1
25.0	25.3	0.3	± 1.1

Cert. No. : ACL25073  
Job No. : VC68AC0059  
Pages : 7 of 8

**8. Level linearity including the level range control**

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	29.0	29.2	0.2	±1.1

**9. Tone burst response**

Time Weighting	Tone burst duration, Tb ( ms )	Cycle	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0



Cert. No. : ACL25073  
Job No. : VC68AC0059  
Pages : 8 of 8

## 10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	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	132.9	-0.1	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

## 11. Overload indication

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

## 12. High level stability

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

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

End of Calibration Certificate

## Certificate of Calibration

## Customer

Name : ALS Laboratory Group Thailand Co., Ltd.  
Address : 104 Soi Phuthumkarn 40, Phuthumkarn Road, Sino Luang, Bangkok 10250Certificate No : 25-SLM-116  
Request No : Req-2025-0603

## Unit Under Calibration Details

Measurement item : Sound Level Meter  
Microphone Class : 2  
Manufacturer : RION  
Microphone Model : UC-52  
Model : NI-42  
Microphone S/N : 143486  
Serial Number : 01222724  
Preamplifier Model : NH-34  
ID : RVG JS0023  
Preamplifier S/N : 22620  
Resolution : 0.1 dB  
Instrument Status : Used

## Calibration Environment and Details

Temperature : 23 °C ± 2 °C  
Humidity : 50 %RH ± 20 %RH  
Barometric Pressure : 1013 hPa ± 10 hPa  
Received Date : 6 March 2025  
Calibrated Date : 19 March 2025  
Calibration Procedure : In-house method CP-SLM-01 based on IEC 61672-3:2013 Electroacoustics - Sound level meters - Part 3: Periodic tests  
Location of Calibration : Lab Acoustic

## Reference Standard

Instrument	Brand	Model	S/N	Due calibration	Traceability
Standard Microphone	Briel & Kjaer	4192	2294985	25 June 2025	NIMT
Audio Generator	Syntek	Svan401	1A1	15 October 2025	WK Electric

## Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %.Calibrated By :   
Mr. Noppadol Liangtatt  
Service Calibration EngineerApproved By :   
Mr. Pasi Mathiassen  
Calibration Engineer Supervisor  
Issue Date : 19 March 2025

The result is valid only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-SLM-01 Rev.01 Issue date 19/02/21

Certificate No : 25-SLM-116  
Request No : Req-2025-0603

## 1. Indication at the calibration check frequency

UUC Setting	Nominal Level	Before Adjust			After Adjust		UNCERTAINTY (± dB)	Acceptance Limit (± dB)	Result
		UUC	ERR	ERR	UUC	ERR			
Calibrator Setting	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)			
1000 Hz 94 dB	94.06	94.0	-0.06	-0.04	94.1	-0.04	0.20	0.30	Pass

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand RION, Model NC-75, SN:35002736

## 2. Self-generated noise, Microphone installed

UUC Setting	Measured (dB)	UNCERTAINTY (± dB)
FAST / 30-130		
UUC Weighting		
A	79.7	0.10

## 3. Self-generated noise, Microphone replaced by the electrical input signal device

UUC Setting	Measured (dB)	UNCERTAINTY (± dB)
FAST / 30-130		
UUC Weighting		
A	74.7	0.10
C	74.0	0.10
Z	73.4	0.10

## 4. Acoustic signal test of frequency weightings (Without Windscreen)

UUC Setting	Deviation from various Frequency Weighting Response curve			UNCERTAINTY (± dB)	Acceptance Limit (± dB)	Result
	A	C	Z			
FAST / 30-130	(dB)	(dB)	(dB)			
STD Setting						
125 Hz	0.0	0.1	0.1	0.60	1.5	Pass
1000 Hz	0.0	0.0	0.0	0.60	1.0	Pass
4000 Hz	1.0	1.0	1.0	0.60	3.0	Pass
8000 Hz	-0.4	-0.4	-0.5	0.70	3.0	Pass

The result is valid only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-SLM-01 Rev.01 Issue date 19/02/21

Certificate No : 25-SLM-116  
Request No : Req-2025-0603

## 5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

UUC Setting	Deviation from various Frequency Weighting Response curve			UNCERTAINTY (± dB)	Acceptance Limit (± dB)	Result
	A (dB)	C (dB)	Z (dB)			
FAST / 30-130						
STD Setting						
63 Hz	-0.2	-0.1	0.0	0.20	2.0	Pass
125 Hz	-0.1	0.1	0.0		1.5	Pass
250 Hz	0.0	0.0	0.0		1.5	Pass
500 Hz	0.0	0.1	0.0		1.5	Pass
1000 Hz	0.0	0.0	0.0		1.0	Pass
2000 Hz	0.0	0.1	0.0		2.0	Pass
4000 Hz	0.0	0.0	0.0		3.0	Pass
8000 Hz	0.1	0.1	0.0		5.0	Pass
16000 Hz	-1.3	-1.4	0.0		±5. -INF	Pass

## 6. Frequency and time weightings at 1 kHz

UUC Setting	STD REF	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)	Result
		UUC	ERR			
FAST / 30-130						
UUC Weighting						
A	114.00	114.0	0.0	0.20	0.20	Pass
C	114.00	114.0	0.0		0.20	Pass
Z	114.00	114.0	0.0		0.20	Pass

UUC Setting	STD REF	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)	Result
		UUC	ERR			
30-130 / A						
UUC Time Response						
Fast	114.00	114.0	0.0	0.20	0.10	Pass
Slow	114.00	114.0	0.0		0.10	Pass
Log	114.00	114.0	0.0		0.10	Pass

The result is valid only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-SLM-01 Rev.01 Issue date 19/02/21



Certificate No	25-SUM-116
Request No	Req-2025-0603

UUC Setting	STD	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance	Result
		REF	UUC	ERR	Limit	
			(dB)	(dB)	( $\pm$ dB)	
FAST / A						
UUC Range						
30-150	29.40	29.7	0.3	0.30	1.1	Pass
	114	114.0	0.0		1.1	Pass

UUC Setting	STD	Anticipated	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance	Result	
A / 30-130	Timeburst	Ref	UUC	ERR		Limit ( $\pm$ dB)		
UUC Time Response	(ms)	(dB)	(dB)	(dB)				
Fast	200	126.0	126.3	-0.3	0.20	1.0	Pass	
	2	109.0	109.0	0.0		+1.0, -2.5	Pass	
	0.25	100.0	99.9	-0.1		+1.5, -5.0	Pass	
Slow	200	119.6	119.6	0.0		1.0	Pass	
	2	100.0	100.0	0.0		+1.0, -5.0	Pass	
	200	120.0	120.0	0.0		1.0	Pass	
SEL	2	100.0	100.0	0.0		0.20	+1.0, -2.5	Pass
	0.25	91.0	90.9	-0.1			+1.5, -5.0	Pass

FM-708-SLM-01 Rev 08 Issue date 7/6/24

Certificate No	25-SLM-116
Request No	Req-2025-0603

*The standard decision rule employed for the statements of conformity in each calibration result will be applied using ILAC-08:00-2015. Guidelines on the Reporting of Compliance with Specifications as Following Fig. 4, and statements:*

*Pass – The measurement result plus the expanded uncertainty with a 95% coverage probability were within the limit.*

*Fail – The measurement result was outside the limit. However, a portion of the expanded uncertainty of measurement at 95% exceeds the limit.*

*Fail – The measurement result was outside the limit. However, a portion of the expanded uncertainty of measurement at 95% is within the limit.*

*Fail – The measurement result plus the expanded uncertainty with a 95% coverage probability were outside the limit.*

**End of Certificate**

FM-708-SLM-01 Rev.018 Issue date: 5/6/24



Cert. No. : ACL25072  
Pages : 1 of 8

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-42 / Microphone UC-52 / Preamplifier NH-24  
**Serial No.:** 01122607 / 145554 / 34373  
**ID No.:** RYG\_FS0019

**Condition As Found :** GOOD

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

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

**Received Date :** 07 JANUARY 2025  
**Calibration Date :** 21 - 23 JANUARY 2025  
**Date of Issue :** 24 JANUARY 2025

REVIEW BY : *[Signature]*  
APPROVED BY : *[Signature]*  
NEXT CAL DATE : 21/ 01/ 2026

**Calibrated by :** Nathakorn Pisutpaisan

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

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

Cert. No. : ACL25072  
Job No. : VC68AC0059  
Pages : 2 of 8

**Calibration Procedure :** CP-AC-01

### Calibration Method :

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

### Condition of this result of calibration :

#### 1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL.BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL.BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL.BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

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

*[Signature]*

Cert. No. : ACL25072  
Job No. : VC68AC0059  
Pages : 3 of 8

### Summary of Measurement Result :

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

*[Signature]*

Cert. No. : ACL25072  
Job No. : VC68AC0059  
Page : 4 of 8

### Result of calibration :

#### 1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

#### 2. Self-generated noise

##### 2.1 Normal test

Measured Value (dB)
16.0

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

Frequency Weighting	Weighting (dB)
A - weight	12.6
C - weight	17.7
Flat	22.6

#### 3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.5	0.5	0.5	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	-1.2	-1.2	-1.2	±5.0

*[Signature]*

Cert. No. : ACL25072  
Job No. : VC68AC0059  
Pages : 5 of 8

## 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	-0.1	±2.0
125	-0.1	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	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

## 5.2 Time weighting at 1 kHz

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

## 6. Long - term stability

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

T. Pich.

Cert. No. : ACL25072  
Job No. : VC68AC0059  
Pages : 6 of 8

## 7. Level linearity on the reference level range

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.1	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	27.0	0.0	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

T. Pich.

Cert. No. : ACL25072  
Job No. : VC68AC0059  
Pages : 7 of 8

## 8. Level linearity including the level range control

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	29.0	29.0	0.0	±1.1

## 9. Tone burst response

Time Weighting	Tone burst duration, Tb ( ms )	Cycle	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Fast	0.25	1	108.0	108.0	0.0	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.1	0.1	1.5 ; -5.0
	200	800	127.6	127.7	0.1	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

T. Pich.

Cert. No. : ACL25072  
Job No. : VC68AC0059  
Pages : 8 of 8

## 10. Peak C sound level

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, L <sub>peak</sub> ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

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

## 11. Overload indication

Measured value ( dB )		Deviated Value ( dB )	Acceptance Limits ( dB )
Positive one-half cycle	Negative one-half cycle		
89.5	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. Pich.

Cert. No. : ACL25074  
Pages : 1 of 8

## Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer : RION  
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24  
Serial No.: 00233187 / 157777 / 22653  
ID No.: RYG\_FS0024

Condition As Found : GOOD

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

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

Received Date : 07 JANUARY 2025  
Calibration Date : 21 - 23 JANUARY 2025  
Date of Issue : 24 JANUARY 2025

REVIEW BY .....  
APPROVED BY .....  
NEXT CAL DATE: 21/01/2026

Calibrated by : Nathakorn Pisutpaisan

Approved by :  
( Thanakul Petchurai )

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

Cert. No. : ACL25074  
Job No. : VC68AC0059  
Pages : 2 of 8

Calibration Procedure : CP-AC-01

## Calibration Method :

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

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

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

## Condition of this result of calibration :

## 1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL_BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL_BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL_BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

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

Cert. No. : ACL25074  
Job No. : VC68AC0059  
Pages : 3 of 8

## Summary of Measurement Result :

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

Cert. No. : ACL25074  
Job No. : VC68AC0059  
Page : 4 of 8

## Result of calibration :

## 1. Absolute sensitivity

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.94)	93.9	0.0	±0.3

## 2. Self-generated noise

## 2.1 Normal test

Measured Value ( dB )
18.2

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

Frequency Weighting ( dB )	Weighting ( dB )
A - weight	13.1
C - weight	19.2
Flat	24.9

## 3. Acoustical signal tests of frequency weightings

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

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



Cert. No. : ACL25074  
Job No. : VC68AC0059  
Pages : 5 of 8

## 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

## 5. Frequency and time weightings at 1 kHz

## 5.1 Frequency weightings at 1 kHz

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

## 5.2 Time weighting at 1 kHz

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

## 6. Long - term stability

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

T. Petch.

Cert. No. : ACL25074  
Job No. : VC68AC0059  
Pages : 6 of 8

## 7. Level linearity on the reference level range

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	132.9	-0.1	± 1.1
132.0	131.9	-0.1	± 1.1
131.0	130.9	-0.1	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.1	0.1	± 1.1
30.0	30.1	0.1	± 1.1
29.0	29.1	0.1	± 1.1
28.0	28.1	0.1	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.2	0.2	± 1.1
25.0	25.2	0.2	± 1.1

T. Petch.

Cert. No. : ACL25074  
Job No. : VC68AC0059  
Pages : 7 of 8

## 8. Level linearity including the level range control

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	29.0	29.1	0.1	±1.1

## 9. Tone burst response

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

T. Petch.

Cert. No. : ACL25074  
Job No. : VC68AC0059  
Pages : 8 of 8

## 10. Peak C sound level

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, L <sub>peak</sub> ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

## 11. Overload indication

Measured value ( dB )		Deviated Value ( dB )	Acceptance Limits ( dB )
Positive one-half cycle	Negative one-half cycle		
89.5	89.5	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. Petch.



## CERTIFICATE OF CALIBRATION

Certificate No. : CDT-035-68

Page 1 of 2 Pages

MEASUREMENT ITEM  
MANUFACTURER  
MODEL/TYPE  
SERIAL NUMBER  
ID NUMBER  
CONDITION AS-RECEIVED  
CUSTOMER

: Heat Stress Monitor  
: Delta OHM  
: HD32.2  
: 15006726  
: RYG\_F50226  
: Used item  
: ALS laboratory group (thailand) Co., Ltd.  
104 Phattanakarn Rd.,  
Khuang Suan Luang, Khet Suan Luang,  
Bangkok 10250 Thailand.

Calibration procedure:  
The temperature calibration was done by  
in-house calibration method as WJCI-001  
according to comparison method with standard  
digital temperature indicator and standard  
temperature probe. The temperature scale use  
was based on ITS-90.

Traceability:  
The measurement results are traceable to the  
international system of units [SI] through  
National Institute of Metrology Thailand (NIMT)  
Certificate number: TT-0047-24, Certificate  
number: TR-0113-24

Reference Used During Calibration:  
1. Standard Temperature Probe  
Model: STS-100 A500, Serial No.: 667682-09,  
Due date: 26 Mar 2025  
2. Digital Temperature Indicator  
Model: DII-1000-A MK II, Serial No.: 671407-  
00591 Due date: 21 Oct 2025

Uncertainty of Measurement:  
The reported uncertainty of measurement is  
based on the standard uncertainty multiplied by  
a coverage factor k=2, which for a normal  
distribution corresponds to a coverage  
probability of approximately 95%. The standard  
uncertainty has been determined in accordance  
with the GUM "Evaluation of measurement data -  
Guide to the expression of uncertainty in  
measurement"

RECEIVED DATE : 17 Jan 2025  
MEASUREMENT DATE : 27 Jan 2025  
ISSUE DATE : 29 Jan 2025

### ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:  
Temperature : 23.0 ± 3.0 °C  
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

### TABULATION OF RESULTS:

The table on next page give the measured values.

REVIEW BY: S.T.S.

APPROVED BY: S.T.S.

NEXT CAL DATE: 26/01/2026

Calibrated by:  
☐ Mr. Sornwit Thuchalad  
☐ Miss Jiraporn Lertsomphol  
☒ Miss Jiraporn Lertsomphol

**J NAC**  
HIRANATEE ASSOCIATES CO.,LTD.

Approved signature:

Mr. Parinya Booncharatun  
Calibration Department Manager

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

Continuation of Certificate of Calibration Number CDT-035-68

Page 2 of 2 Pages

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

### Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 15015841.  
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.067	20.1	0.0	0.16
80	25.060	25.0	-0.1	0.099
80	30.050	30.0	-0.1	0.099
80	35.041	35.0	0.0	0.099
80	40.028	40.0	0.0	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2, S/N: 20008282.  
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.067	20.1	0.0	0.099
110	25.060	25.1	0.0	0.099
110	30.051	30.1	0.0	0.16
110	35.041	35.1	0.1	0.099
110	40.028	40.0	0.0	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 15015494.  
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.067	20.2	0.1	0.099
75	25.060	25.0	-0.1	0.099
75	30.051	29.9	-0.2	0.099
75	35.041	34.9	-0.1	0.099
75	40.028	39.8	-0.2	0.099

UUC\*: Unit Under Calibration

Remark: The reported uncertainty of measurement is 0.16, based on standard uncertainty multiplied by a coverage factor k=2.21 providing a level of confidence of approximately 95%.

\*\*\*End of Certificate of Calibration\*\*\*

**J NAC**  
HIRANATEE ASSOCIATES CO.,LTD.

## CERTIFICATE OF CALIBRATION

Certificate No. : CDT-006-68

Page 1 of 2 Pages

MEASUREMENT ITEM  
MANUFACTURER  
MODEL/TYPE  
SERIAL NUMBER  
ID NUMBER  
CONDITION AS-RECEIVED  
CUSTOMER

: Heat Stress Monitor  
: Delta OHM  
: HD32.2  
: 18018311  
: RYG\_F50356  
: Used item  
: ALS laboratory group (thailand) Co., Ltd.  
104 Phattanakarn Rd.,  
Khuang Suan Luang, Khet Suan Luang,  
Bangkok 10250 Thailand.

Calibration procedure:  
The temperature calibration was done by  
in-house calibration method as WJCI-001  
according to comparison method with standard  
digital temperature indicator and standard  
temperature probe. The temperature scale use  
was based on ITS-90.

Traceability:  
The measurement results are traceable to the  
international system of units [SI] through  
National Institute of Metrology Thailand (NIMT)  
Certificate number: TT-0047-24, Certificate  
number: TR-0113-24

Reference Used During Calibration:  
1. Standard Temperature Probe  
Model: STS-100 A500, Serial No.: 667682-09,  
Due date: 26 Mar 2025  
2. Digital Temperature Indicator  
Model: DII-1000-A MK II, Serial No.: 671407-  
00591 Due date: 21 Oct 2025

Uncertainty of Measurement:  
The reported uncertainty of measurement is  
based on the standard uncertainty multiplied by  
a coverage factor k=2, which for a normal  
distribution corresponds to a coverage  
probability of approximately 95%. The standard  
uncertainty has been determined in accordance  
with the GUM "Evaluation of measurement data -  
Guide to the expression of uncertainty in  
measurement"

RECEIVED DATE : 27 Dec 2024  
MEASUREMENT DATE : 07 Jan 2025  
ISSUE DATE : 08 Jan 2025

### ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:  
Temperature : 23.0 ± 3.0 °C  
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

### TABULATION OF RESULTS:

The table on next page give the measured values.

REVIEW BY: S.T.S.

APPROVED BY: S.T.S.

NEXT CAL DATE: 07/01/2026

Calibrated by:  
☐ Mr. Sornwit Thuchalad  
☐ Miss Jiraporn Lertsomphol  
☒ Miss Jiraporn Lertsomphol

**J NAC**  
HIRANATEE ASSOCIATES CO.,LTD.

Approved signature:

Mr. Parinya Booncharatun  
Calibration Department Manager

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

Continuation of Certificate of Calibration Number CDT-006-68

Page 2 of 2 Pages

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

### Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 18021466.  
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.062	20.1	0.0	0.16
80	25.061	25.0	0.0	0.16
80	30.052	30.0	-0.1	0.099
80	35.044	35.0	0.0	0.099
80	40.035	40.0	0.0	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2, S/N: 18020493.  
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.062	20.1	0.0	0.099
110	25.061	25.2	0.1	0.099
110	30.052	30.1	0.0	0.099
110	35.044	35.1	0.1	0.099
110	40.035	40.1	0.1	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 18021258.  
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.062	20.2	0.1	0.099
75	25.061	25.1	0.0	0.099
75	30.052	30.1	0.0	0.16
75	35.044	35.0	0.0	0.099
75	40.034	39.9	-0.1	0.099

UUC\*: Unit Under Calibration

Remark: The reported uncertainty of measurement is 0.16, based on standard uncertainty multiplied by a coverage factor k=2.21 providing a level of confidence of approximately 95%.

\*\*\*End of Certificate of Calibration\*\*\*

**J NAC**  
HIRANATEE ASSOCIATES CO.,LTD.



## CERTIFICATE OF CALIBRATION

Certificate No. : CDT-008-68

Page 1 of 2 Pages

**MEASUREMENT ITEM** : Heat Stress Monitor  
**MANUFACTURER** : Delta OHM  
**MODEL/TYPE** : HD32.2  
**SERIAL NUMBER** : 18018314  
**ID NUMBER** : RYG\_F50358  
**CONDITION AS-RECEIVED** : Used item  
**CUSTOMER** : AIS laboratory group (thailand) Co., Ltd.  
104 Phatthanakan 40, Phatthanakan Rd.,  
Khaeng Suan Luang, Khut Suan Luang,  
Bangkok 10250 Thailand.

**RECEIVED DATE** : 27 Dec 2024  
**MEASUREMENT DATE** : 07 Jan 2025  
**ISSUE DATE** : 08 Jan 2025

### ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:  
Temperature : 23.0 ± 3.0 °C  
Relative Humidity : 55.0 ± 15.0 %RH

**NOTED:** The certificate is valid only to the item calibrated on date and place of calibration.

### TABULATION OF RESULTS:

The table on next page give the measured values.

REVIEW BY: *Sgt S*

APPROVED BY: *[Signature]*

NEXT CAL DATE: 07/01/26

Calibrated by:  
[Mr. Suporn Phachalad]  
[Mr. Jiraporn Lertsamphol]  
[Ms. Jiraporn Phachalad]



Approved signatory: *[Signature]*  
Mr. Parinya Booncharoen  
Calibration Department Manager

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

Continuation of Certificate of Calibration Number CDT-008-68

Page 2 of 2 Pages

**Result of Calibration:** ☒ Without Adjustment ☐ With Adjustment

**Calibration Range:** 20 °C to 40 °C

### Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 18021467.  
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.064	20.3	0.0	0.099
80	25.063	25.1	0.0	0.099
80	30.047	30.1	0.1	0.099
80	35.037	35.1	0.1	0.099
80	40.024	40.0	0.0	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP327.2, S/N: 18020197.  
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.064	20.1	0.0	0.099
110	25.063	25.1	0.0	0.099
110	30.047	30.1	0.1	0.099
110	35.037	35.1	0.1	0.099
110	40.024	40.1	0.1	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 18021270.  
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.064	20.1	0.2	0.099
75	25.064	25.2	0.1	0.16
75	30.047	30.0	0.0	0.099
75	35.037	34.9	-0.1	0.099
75	40.024	39.9	-0.1	0.099

UUC\*: Unc Under Calibration  
Remark: The reported uncertainty of measurement is 0.16, based on standard uncertainty multiplied by a coverage factor k=2.21 providing a level of confidence of approximately 95%.

\*\*\*End of Certificate of Calibration\*\*\*



## CERTIFICATE OF CALIBRATION

Certificate No. : CDT-009-68

Page 1 of 2 Pages

**MEASUREMENT ITEM** : Heat Stress Monitor  
**MANUFACTURER** : Delta OHM  
**MODEL/TYPE** : HD32.2  
**SERIAL NUMBER** : 18018314  
**ID NUMBER** : RYG\_F50359  
**CONDITION AS-RECEIVED** : Used item  
**CUSTOMER** : AIS laboratory group (thailand) Co., Ltd.  
104 Phatthanakan 40, Phatthanakan Rd.,  
Khaeng Suan Luang, Khut Suan Luang,  
Bangkok 10250 Thailand.

**RECEIVED DATE** : 27 Dec 2024  
**MEASUREMENT DATE** : 08 Jan 2025  
**ISSUE DATE** : 08 Jan 2025

### ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:  
Temperature : 23.0 ± 3.0 °C  
Relative Humidity : 55.0 ± 15.0 %RH

**NOTED:** The certificate is valid only to the item calibrated on date and place of calibration.

### TABULATION OF RESULTS:

The table on next page give the measured values.

REVIEW BY: *Sgt S*

APPROVED BY: *[Signature]*

NEXT CAL DATE: 08/01/26

Calibrated by:  
[Mr. Suporn Phachalad]  
[Mr. Jiraporn Lertsamphol]  
[Ms. Jiraporn Phachalad]



Approved signatory: *[Signature]*  
Mr. Parinya Booncharoen  
Calibration Department Manager

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Continuation of Certificate of Calibration Number CDT-009-68

Page 2 of 2 Pages

**Result of Calibration:** ☒ Without Adjustment ☐ With Adjustment

**Calibration Range:** 20 °C to 40 °C

### Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 18021465.  
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.052	20.0	-0.1	0.099
80	25.058	25.0	-0.1	0.099
80	30.056	30.1	0.0	0.099
80	35.045	34.9	-0.1	0.16
80	40.037	39.9	-0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP327.2, S/N: 20008280.  
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.052	20.0	-0.1	0.099
110	25.058	25.1	0.0	0.16
110	30.056	30.1	0.0	0.099
110	35.044	35.1	0.1	0.099
110	40.037	40.1	0.1	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 18021262.  
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.052	20.1	0.0	0.099
75	25.058	25.0	-0.1	0.099
75	30.056	29.9	-0.2	0.099
75	35.044	34.8	-0.2	0.099
75	40.037	39.7	-0.3	0.099

UUC\*: Unc Under Calibration  
Remark: The reported uncertainty of measurement is 0.16, based on standard uncertainty multiplied by a coverage factor k=2.21 providing a level of confidence of approximately 95%.

\*\*\*End of Certificate of Calibration\*\*\*





## CERTIFICATE OF CALIBRATION

Certificate No. : CDT-142-67

Page 1 of 2 Pages

MEASUREMENT ITEM  
MANUFACTURER  
MODEL/TYPE  
SERIAL NUMBER  
ID NUMBER  
CONDITION AS-RECEIVED  
CUSTOMER

: Heat Stress Monitor  
: Delta OHM  
: HD32.2  
: 22016385  
: RYG\_FS0578  
: Used item  
: ALS laboratory group (thailand) Co., Ltd.  
: 104 Phatthanakan 40, Phatthanakan Rd.,  
: Khwaeng Suan Luang, Khet Suan Luang,  
: Bangkok 10250 Thailand.

RECEIVED DATE  
MEASUREMENT DATE  
ISSUE DATE

: 19 Jul 2024  
: 06 Aug 2024  
: 07 Aug 2024

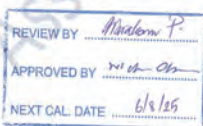
### ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:  
Temperature : 23.0 ± 3.0 °C  
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

### TABULATION OF RESULTS:

The table on next page give the measured values.



Approved signatory:

Mr. Parinya Booncharoen  
Calibration Department Manager

Calibrated by:

- ☐ Mr. Sorawit Thachalad  
☐ Miss Jittaporn Lertsomphol  
☐ Miss Ruangrumpai Phoommit

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

Calibration procedure:  
The temperature calibration was done by  
In-House calibration method as WHCL-001  
according to comparison method with standard  
digital temperature indicator and standard  
temperature probe. The temperature scale use  
was based on ITS-90.

### Traceability:

The measurement results are traceable to the  
international system of units (SI) through  
National Institute of Metrology Thailand (NIMT)  
Certificate number: TS-0047-24, Certificate  
number: ER-0101-23

### Reference Used During Calibration:

1. Standard Temperature Probe  
Model: STS-100 AS500, Serial No.: 667682-05,  
Due date: 26 Mar 2025
2. Digital Temperature Indicator  
Model: DTI-1000-A MK II, Serial No.: 673407-  
00591 Due date: 14 Sep 2024

### Uncertainty of Measurement:

The reported uncertainty of measurement is  
based on the standard uncertainty multiplied by a  
coverage factor k=2, which for a normal  
distribution corresponds to a coverage  
probability of approximately 95%. The standard  
uncertainty has been determined in accordance  
with the GUM 'Evaluation of measurement data -  
Guide to the expression of uncertainty in  
measurement'

Continuation of Certificate of Calibration Number CDT-142-67

Page 2 of 2 Pages

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

### Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2 S/N: 22015694.  
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.059	19.9	-0.2	0.099
80	25.054	24.9	-0.2	0.099
80	30.047	29.9	-0.1	0.099
80	35.036	34.9	-0.1	0.099
80	40.029	39.8	-0.2	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N: 22023956.  
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.060	20.1	0.0	0.099
110	25.054	25.1	0.0	0.099
110	30.047	30.1	0.1	0.099
110	35.036	35.1	0.1	0.099
110	40.029	40.1	0.1	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 22025031.  
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.059	20.2	0.1	0.099
75	25.053	25.1	0.0	0.099
75	30.047	30.0	-0.1	0.16
75	35.036	34.9	-0.1	0.099
75	40.029	39.8	-0.2	0.099

UUC\*: Unit Under Calibration

Remark: The reported uncertainty of measurement is 0.16, based on standard uncertainty multiplied by a coverage factor k=2.21  
providing a level of confidence of approximately 95%.

\*\*\*End of Certificate of Calibration\*\*\*



Continuation of Certificate of Calibration Number CDT-143-67

Page 2 of 2 Pages

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

### Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2 S/N: 22015701.  
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.060	20.0	-0.3	0.099
80	25.053	25.0	-0.1	0.099
80	30.048	30.0	0.0	0.099
80	35.038	34.9	-0.1	0.099
80	40.029	39.9	-0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N: 22023934.  
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.060	20.1	0.0	0.099
110	25.052	25.1	0.0	0.099
110	30.048	30.1	0.1	0.099
110	35.037	35.1	0.1	0.099
110	40.029	40.1	0.1	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 22025053.  
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.060	20.2	0.1	0.099
75	25.052	25.1	0.0	0.099
75	30.048	30.0	0.0	0.099
75	35.038	35.0	0.0	0.099
75	40.029	39.9	-0.1	0.099

UUC\*: Unit Under Calibration

\*\*\*End of Certificate of Calibration\*\*\*



## CERTIFICATE OF CALIBRATION

Certificate No. : CDT-143-67

Page 1 of 2 Pages

MEASUREMENT ITEM  
MANUFACTURER  
MODEL/TYPE  
SERIAL NUMBER  
ID NUMBER  
CONDITION AS-RECEIVED  
CUSTOMER

: Heat Stress Monitor  
: Delta OHM  
: HD32.2  
: 22016389  
: RYG\_FS0579  
: Used item  
: ALS laboratory group (thailand) Co., Ltd.  
: 104 Phatthanakan 40, Phatthanakan Rd.,  
: Khwaeng Suan Luang, Khet Suan Luang,  
: Bangkok 10250 Thailand.

RECEIVED DATE  
MEASUREMENT DATE  
ISSUE DATE

: 19 Jul 2024  
: 06 Aug 2024  
: 07 Aug 2024

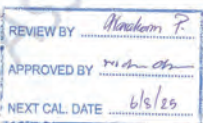
### ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:  
Temperature : 23.0 ± 3.0 °C  
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

### TABULATION OF RESULTS:

The table on next page give the measured values.



Approved signatory:

Mr. Parinya Booncharoen  
Calibration Department Manager

Calibrated by:

- ☐ Mr. Sorawit Thachalad  
☐ Miss Jittaporn Lertsomphol  
☐ Miss Ruangrumpai Phoommit

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

Calibration procedure:  
The temperature calibration was done by  
In-House calibration method as WHCL-001  
according to comparison method with standard  
digital temperature indicator and standard  
temperature probe. The temperature scale use  
was based on ITS-90.

### Traceability:

The measurement results are traceable to the  
international system of units (SI) through  
National Institute of Metrology Thailand (NIMT)  
Certificate number: TS-0047-24, Certificate  
number: ER-0101-23

### Reference Used During Calibration:

1. Standard Temperature Probe  
Model: STS-100 AS500, Serial No.: 667682-05,  
Due date: 26 Mar 2025
2. Digital Temperature Indicator  
Model: DTI-1000-A MK II, Serial No.: 673407-  
00591 Due date: 14 Sep 2024

### Uncertainty of Measurement:

The reported uncertainty of measurement is  
based on the standard uncertainty multiplied by a  
coverage factor k=2, which for a normal  
distribution corresponds to a coverage  
probability of approximately 95%. The standard  
uncertainty has been determined in accordance  
with the GUM 'Evaluation of measurement data -  
Guide to the expression of uncertainty in  
measurement'



## CERTIFICATE OF CALIBRATION

Certificate No. : CDT-144-67

Page 1 of 2 Pages

MEASUREMENT ITEM  
MANUFACTURER  
MODEL/TYPE  
SERIAL NUMBER  
ID NUMBER  
CONDITION AS-RECEIVED  
CUSTOMER

: Heat Stress Monitor  
: Delta OHM  
: HD32.2  
: 22016390  
: RYG\_FS0580  
: Used item  
: ALS laboratory group (thailand) Co., Ltd.  
104 Phatthanakan 40, Phatthanakan Rd.,  
Khwaeng Suan Luang, Khet Suan Luang,  
Bangkok 10250 Thailand.

RECEIVED DATE  
MEASUREMENT DATE  
ISSUE DATE

: 19 Jul 2024  
: 07 Aug 2024  
: 07 Aug 2024

### ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:  
Temperature : 23.0 ± 3.0 °C  
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

### TABULATION OF RESULTS:

The table on next page give the measured values.

REVIEW BY: *Handom P*  
APPROVED BY: *Handom P*  
NEXT CAL DATE: 4/8/25

Calibration procedure:  
The temperature calibration was done by  
In-House calibration method as WH-CL-001  
according to comparison method with standard  
digital temperature indicator and standard  
temperature probe. The temperature scale use  
was based on ITS-90.

Traceability:  
The measurement results are traceable to the  
international system of units (SI) through  
National Institute of Metrology (NIMT)  
Certificate number: TT-0047-24, Certificate  
number: ER-0101-23

### Reference Used During Calibration:

1. Standard Temperature Probe  
Model: STS-100 AS00, Serial No.: 667682-05,  
Due date: 26 Mar 2025  
2. Digital Temperature Indicator  
Model: DTI-1000-A MK II, Serial No.: 673407-  
00591 Due date: 14 Sep 2024

Uncertainty of Measurement:  
The reported uncertainty of measurement is  
based on the standard uncertainty multiplied by  
a coverage factor k=2, Which for a normal  
distribution corresponds to a coverage  
probability of approximately 95%. The standard  
uncertainty has been determined in accordance  
with the GUM Evaluation of measurement data  
- Guide to the expression of uncertainty in  
measurement

Calibrated by:  
☐ Mr. Sorawit Thachalad  
☒ Miss Jittaporn Lertsomphol  
☐ Miss Ruangrupal Phoommit



Approved signatory: *Handom P*  
Mr. Parinya Booncharoen  
Calibration Department Manager

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IN WRITING FROM THE LABORATORY

Continuation of Certificate of Calibration Number CDT-144-67

Page 2 of 2 Pages

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

### Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2 S/N: 22025580.  
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.059	20.0	-0.1	0.099
80	25.054	25.0	-0.1	0.099
80	30.045	30.0	-0.1	0.099
80	35.036	34.9	-0.1	0.099
80	40.027	39.9	-0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N: 22023942.  
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.059	20.1	0.0	0.099
110	25.054	25.1	0.0	0.099
110	30.045	30.1	0.1	0.099
110	35.037	35.0	0.0	0.099
110	40.027	40.0	0.0	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 22025040.  
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.059	20.1	0.0	0.099
75	25.054	25.0	-0.1	0.099
75	30.045	29.9	-0.1	0.099
75	35.037	34.9	-0.1	0.099
75	40.027	39.8	-0.2	0.099

UUC\*: Unit Under Calibration

\*\*\*End of Certificate of Calibration\*\*\*



## CERTIFICATE OF CALIBRATION

Certificate No. : CDT-145-67

Page 1 of 2 Pages

MEASUREMENT ITEM  
MANUFACTURER  
MODEL/TYPE  
SERIAL NUMBER  
ID NUMBER  
CONDITION AS-RECEIVED  
CUSTOMER

: Heat Stress Monitor  
: Delta OHM  
: HD32.2  
: 22016391  
: RYG\_FS0581  
: Used item  
: ALS laboratory group (thailand) Co., Ltd.  
104 Phatthanakan 40, Phatthanakan Rd.,  
Khwaeng Suan Luang, Khet Suan Luang,  
Bangkok 10250 Thailand.

RECEIVED DATE  
MEASUREMENT DATE  
ISSUE DATE

: 19 Jul 2024  
: 07 Aug 2024  
: 07 Aug 2024

### ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:  
Temperature : 23.0 ± 3.0 °C  
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

### TABULATION OF RESULTS:

The table on next page give the measured values.

REVIEW BY: *Handom P*  
APPROVED BY: *Handom P*  
NEXT CAL DATE: 4/8/25

Calibration procedure:  
The temperature calibration was done by  
In-House calibration method as WH-CL-001  
according to comparison method with standard  
digital temperature indicator and standard  
temperature probe. The temperature scale use  
was based on ITS-90.

Traceability:  
The measurement results are traceable to the  
international system of units (SI) through  
National Institute of Metrology (NIMT)  
Certificate number: TT-0047-24, Certificate  
number: ER-0101-23

### Reference Used During Calibration:

1. Standard Temperature Probe  
Model: STS-100 AS00, Serial No.: 667682-05,  
Due date: 26 Mar 2025  
2. Digital Temperature Indicator  
Model: DTI-1000-A MK II, Serial No.: 673407-  
00591 Due date: 14 Sep 2024

Uncertainty of Measurement:  
The reported uncertainty of measurement is  
based on the standard uncertainty multiplied by  
a coverage factor k=2, Which for a normal  
distribution corresponds to a coverage  
probability of approximately 95%. The standard  
uncertainty has been determined in accordance  
with the GUM Evaluation of measurement data  
- Guide to the expression of uncertainty in  
measurement

Calibrated by:  
☐ Mr. Sorawit Thachalad  
☒ Miss Jittaporn Lertsomphol  
☐ Miss Ruangrupal Phoommit



Approved signatory: *Handom P*  
Mr. Parinya Booncharoen  
Calibration Department Manager

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

Continuation of Certificate of Calibration Number CDT-145-67

Page 2 of 2 Pages

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

### Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2 S/N: 22025583.  
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.059	19.9	-0.2	0.099
80	25.054	24.9	-0.2	0.099
80	30.044	29.9	-0.1	0.099
80	35.036	34.9	-0.1	0.099
80	40.026	39.8	-0.2	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N: 22023943.  
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.059	20.0	0.0	0.16
110	25.054	25.0	0.0	0.16
110	30.044	30.0	0.0	0.099
110	35.036	35.0	0.0	0.099
110	40.026	40.0	0.0	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 22025054.  
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.059	20.0	-0.1	0.099
75	25.054	25.0	-0.1	0.099
75	30.044	29.9	-0.1	0.099
75	35.036	34.9	-0.1	0.099
75	40.026	39.8	-0.2	0.099

UUC\*: Unit Under Calibration

Remark: The reported uncertainty of measurement is 0.16, based on standard uncertainty multiplied by a coverage factor k=2.11  
providing a level of confidence of approximately 95%.

\*\*\*End of Certificate of Calibration\*\*\*



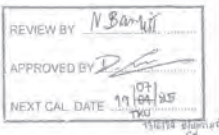




Cert.No.: 24CH96  
Page.: 1 of 3

## Certificate of Calibration

Equipment : pH Meter  
Manufacturer : Mettler Toledo  
Model : SevenCompact S220  
Serial No. : C104059460  
ID No. : RYG\_EN0183  
Condition As-Received: Used Item  
Received Date : 18 January 2024  
Calibration Date : 19 January 2024  
Reference : 2401-0579DSC-2  
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)  
616/10 Moo 5, T.Maenam Khu,  
A.Phuakdaeng, Rayong 21140, Thailand



Ambient Temperature :  $(25 \pm 2.5) ^\circ\text{C}$   
Relative Humidity :  $(50 \pm 15) \%$   
Calibration Procedure : In-house method  
- CP-CH5 by direct measurement with standard voltage calibrator and direct measurement with certified reference material (CRM)  
- CP-CH8 by comparison with temperature standard

Calibrated by : Warakorn Lemgagrakul

Approved by :

(☒) Sallhip Maangmai  
(☐) Warakorn Lemgagrakul  
(☐) Porpan Palpim

Issue Date : 24 January 2024

The Uncertainties are for a confidence probability of approximately 95%.

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A 0062854



Cert.No.: 24CH96  
Page.: 2 of 3

### Condition of this calibration result

- Reference Standard Instrument
- Instrument

Serial No.	ID No.	Cert. No.	Due Date
54030049	130RC116	23E2802	27 Aug 2024
4982054	110RC044	23B908	26 July 2024

This certification is traceable to the International System of Unit maintained through:-  
- Technology Promotion Association (Thailand-Japan)

- Certified Reference Materials : The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.008	CPA chem	840102	27 Nov 2025
pH 6.986	CPA chem	840104	02 Nov 2024
pH 9.997	CPA chem	840106	02 Nov 2024

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

### Calibration Results

Function : mV Measurement

Performing standard curve by Fluke at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (±mV)	Coverage factor k
			mV	pH		
pH Meter S/N : C104059460	4.000	177.48	177.4	4.000	0.058	2.00
	7.000	0.00	0.0	7.000	0.058	2.00
	10.000	-177.48	-177.5	10.000	0.058	2.00

A 1198287



Cert.No.: 24CH96  
Page.: 3 of 3

### Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4.01,7.00,10.01)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor k
pH Electrode S/N : 3225367	4.008	4.013	176.0	0.0054	2.07
	6.986	6.983	2.2	0.0084	2.00
	9.997	9.995	-174.1	0.0065	2.00

Function : Temperature Measurement

(\*) Without adjustment

This equipment was connected with Temperature Probe:

- Model : InLab6Expert Pro-ISM

- Serial No. : 3225367

Dimension of probe

- Length : 120 mm.

- Diameter : 12 mm.

- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
25.0	25.001	25.2	0.199	0.13	2.00

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

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A 1198286



## Certificate of Calibration

Certificate No.: 24E289  
Page : 1 of 2

Equipment : pH Meter  
Manufacturer : Mettler Toledo  
Model : SevenCompact S220  
Serial No. : C104059460  
ID No. : RYG\_EN0183

Condition As-Received: Used Item  
Received Date : 18 January 2024  
Calibration Date : 23 January 2024

Reference : 2401-0579DSC  
Ambient Temperature :  $(23 \pm 2) ^\circ\text{C}$   
Relative Humidity :  $(50 \pm 10) \%$

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

Procedure used : Calibration were conducted using calibration procedure No. CP-E17 According to EURAMET cg-16.

### Condition of this result of calibration

- Reference standards instruments:

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Multi-Product Calibrator	5500A	6315011	E209300035	29 May 2024

- This result of calibration was made on requested at the point specified by customer.

- The certificate is valid only to the item calibrated on date and place of calibration.

- This Certification is traceable to the International System of Unit maintained through:-

-NA Caltechologies Co., Ltd., ANAB Accredited No. Calibration AC-2838

Calibrated by : Wudkarnworn Wongchabkum  
Issue Date : 24 January 2024

Approved Signatory :

(☒) Piyasinee Pitsatnapan  
(☒) Nuntawat Khunthaisai  
(☐) Pongpatam Boonyadorn

A 0333296



Cert. No.: 24E289  
Page: 2 of 2

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

Function: DC voltage measurement	Range: 2000. mV		
Standard Value	UUC* Reading	Error	Uncertainty
( mV )	( mV )	( mV )	( ± µV )
-200.0000	-200.0	0.0	68
-150.0000	-150.0	0.0	65
-100.0000	-100.0	0.0	63
-50.0000	-50.0	0.0	61
0.0000	0.0	0.0	58
50.0000	50.0	0.0	61
100.0000	99.9	-0.1	63
150.0000	149.9	-0.1	65
200.0000	199.9	-0.1	68

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

UUC\* = Unit Under Calibration.

-000-

1198963



## Certificate of Calibration

Equipment: SPECTROPHOTOMETER  
Model: DR6000  
Serial No. (or ID.): 1627845 (RYG\_EN0037)  
Manufacturer: HACH  
Condition: In Condition

Certificate No.: C06250108  
Issued Date: 18 March 2025  
Job No.: WO-00064379  
Page: 1 of 3

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

Environment Condition: Temperature 24.4 °C ± 0.3 °C  
Humidity 60.8 %RH ± 3.5 %RH

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

Calibration By: Mr.Preecha Phoosai  
Calibration Date: 18 March 2025  
The Method used: In house method, CAL-WI-24, base on ASTM E 275-08 and ASTM E 387-04  
Traceability: This certificate is traceable to the CRM maintained by National Institute of Standards and Technology (NIST) through Stama Scientific Limited.

The standard for Wavelength Certificate No. 111583 and 111584  
The standard for Photometric Certificate No. 9114984 and 111588  
The standard for Stray light Certificate No. 111586 and 111585  
The standard for Spectral resolution Certificate No. 111587

(Mr. Preecha Phoosai)  
Person in charge

(Miss Kaewkan Suradech)  
Authorized signatory

This certificate is issued in 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 in the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor ( $k=2$ ) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM).  
These results may be affected by deviations from specified conditions. The results relate only to the items tested, calibrated or sampled. The report shall not be reproduced except in full without approval of DKSH Technology Limited.

DKSH Technology Limited  
2533 Sukhumvit Road, Bangkok, Phra Prachin, Bangkok 10260  
Phone: +66 2058 7000 Email: info.calibration@dksh.com Website: www.dksh.com/calibration/thailand

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CAL-FM-C06-16 11 Mar 2024



Certificate No.: C06250108 Page 2 of 3

### Calibration Results: Without Adjustment

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

Standard Wavelength	Unit Under Calibration	Correction	Uncertainty
418.61	418.5	0.11	0.13
536.66	536.7	-0.04	0.13
637.98	638.3	-0.32	0.13
748.48	748.8	-0.32	0.13
807.03	807.5	-0.47	0.13

Photometric Accuracy (Absorbance)

Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
420 nm	0.0000	0.000	0.0000	0.0045
	0.2930	0.291	0.0020	0.0045
	0.5168	0.518	-0.0012	0.0045
	1.0298	1.031	-0.0012	0.0045
440 nm	0.0000	0.000	0.0000	0.0045
	0.2667	0.285	0.0017	0.0045
	0.5073	0.508	-0.0007	0.0045
	1.0083	1.009	-0.0007	0.0045
465 nm	0.0000	0.000	0.0000	0.0045
	0.2516	0.250	0.0016	0.0045
	0.4595	0.461	-0.0015	0.0045
	0.9334	0.935	-0.0016	0.0045
546.1 nm	0.0000	0.000	0.0000	0.0045
	0.2461	0.246	0.0001	0.0045
	0.4652	0.466	-0.0008	0.0045
	0.9468	0.948	-0.0012	0.0045
590 nm	0.0000	0.000	0.0000	0.0045
	0.2594	0.259	0.0004	0.0045
	0.5040	0.505	-0.0010	0.0045
	1.0032	1.004	-0.0008	0.0045
635 nm	0.0000	0.000	0.0000	0.0045
	0.2579	0.258	-0.0001	0.0045
	0.4971	0.497	0.0001	0.0045
	0.9720	0.973	-0.0010	0.0045

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Phone: +66 2058 7000 Email: info.calibration@dksh.com Website: www.dksh.com/calibration/thailand

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CAL-FM-C06-16 11 Mar 2024



Certificate No.: C06250108 Page 3 of 3

### Calibration Results: Without Adjustment

Photometric Accuracy (Absorbance)

Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
235 nm	0.0000	0.000	0.0000	0.0080
	0.7355	0.738	-0.0025	0.0080
257 nm	0.0000	0.000	0.0000	0.0080
	0.8574	0.857	0.0004	0.0080
313 nm	0.0000	0.000	0.0000	0.0080
	0.2864	0.290	-0.0036	0.0080
350 nm	0.0000	0.000	0.0000	0.0080
	0.6374	0.637	0.0004	0.0080

Stray light \*

Standard: cut-off	UUC: Wavelength (nm)	UUC: Transmission (%T)	Absorbance (A)
260.62 +/- 0.11 nm	260.6	1.7	1.770
391.44 +/- 0.11 nm	391.4	1.4	1.854

Spectral Resolution \*

Nominal Concentration 0.02 % v/v	Peak	Trough	Ratio	SBW
Standard Wavelength (nm)	268.68	266.69	1.38	2.00
UUC: Wavelength (nm)	268.2	266.2		
Std Absorbance (A)	0.4595	0.2780		
UUC: Absorbance (A)	0.415	0.299		

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

The End of Certificate

DKSH Technology Limited  
2533 Sukhumvit Road, Bangkok, Phra Prachin, Bangkok 10260  
Phone: +66 2058 7000 Email: info.calibration@dksh.com Website: www.dksh.com/calibration/thailand

Delivering Growth - in Asia and Beyond.

CAL-FM-C06-16 11 Mar 2024



# ใบตรวจสอบสภาพเครื่องวัดสิ่งแวดล้อม



เลขที่ใบงาน: WO-00064379

ชนิดเครื่องวัด: SPECTROPHOTOMETER

รุ่น: DR6000

หมายเลขเครื่อง: 1627845

ตรวจสอบ (รับ)		รายการตรวจเช็ค	ตรวจสอบ (ส่ง)		หมายเหตุ
18 Mar 2025			18 Mar 2025		
ปกติ	ไม่ปกติ		ปกติ	ไม่ปกติ	
General					
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. ความสมบูรณ์เครื่อง	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. ความสะอาด ( ช่องใส่ตัวอย่าง, ภายใน-นอกเครื่อง)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. สวิตช์ ปิด - เปิด เครื่อง (On-Off Switch)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. ปุ่มกด (Keypad)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. หน้าจอ (Display, Screen Contrast)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Spectrophotometer					
<input type="checkbox"/>	<input type="checkbox"/>	6. แรงดันไฟฟ้า (Battery Backup) >= 2.5 VDC	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	7. จำนวนเลือกความยาวคลื่น (Wavelength Control)	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. ความยาวคลื่น (Wavelength Check)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	*
<input checked="" type="checkbox"/>	<input type="checkbox"/>	9. แหล่งกำเนิดแสง (UV < 3,000 hour)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.5 Hours
<input checked="" type="checkbox"/>	<input type="checkbox"/>	10. แหล่งกำเนิดแสง (Visible < 5,000 hour)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	893.0 Hours
<input checked="" type="checkbox"/>	<input type="checkbox"/>	11. ช่องจัดหลายตัวอย่าง (Carousel Module)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
pH Meter and Conductivity Meter					
<input type="checkbox"/>	<input type="checkbox"/>	12. อิเล็กโทรด (Electrode and Connection Cable )	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	13. ระดับสารละลายใน Electrode (Level KCl )	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	14. ฝาปิดกันปลาย Electrode (Dust Protection Hood)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	15. ขาจับอิเล็กโทรด (Stand)	<input type="checkbox"/>	<input type="checkbox"/>	
Turbidimeter					
<input type="checkbox"/>	<input type="checkbox"/>	16. ค่าความขุ่นที่ต่ำสุด (No Sample)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	17. ระดับการส่องสว่างของแสง (>= 2.5 ไม่นเกิน 3.0)	<input type="checkbox"/>	<input type="checkbox"/>	
Automatic titrator					
<input type="checkbox"/>	<input type="checkbox"/>	18. สภาพ Piston Burettes	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	19. Function Rinsing and Dosing	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	20. ระบบท่อสายยางและอุปกรณ์ประกอบ	<input type="checkbox"/>	<input type="checkbox"/>	

เพิ่มเส้นขอบบนล่าง: \* 656.1nm = 656.1nm

\* 486.0nm = 485.7nm

Mr.Preecha Phooasai  
Service Engineer

ชื่อบริษัท เทคโนโลยี จำกัด  
DKSH Technology Limited  
2533 ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110  
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CAL-FMR37-03 20 Jul 2022



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534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250  
TEL. 0-2717-3000-29 FAX. 0-2719-9484



## Certificate of Calibration

Cert. No.: 25LM10  
Page.: 1 of 2

Equipment : DO Meter with Sensor  
Manufacturer : YSI  
Model : 5000-115V  
Serial No. : 15E102796  
ID No. : RYG\_EN0032

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

Location : TPA On Site Calibration Laboratory

Received Order : 17 January 2025  
Calibrated Date : 20 January 2025  
Ambient Temperature : (  $26 \pm 10$  ) °C  
Relative Humidity : (  $50 \pm 30$  ) %  
AC Line Voltage : (  $220 \pm 22$  ) V

Calibrated by : Warakorn Lemgagrakul

Approved by :   
Approved Signatory

( ) Chakrit Waewwanjua  
(✓) Suwit Imjai  
( ) Kunchit Promprat

Issue Date : 23 January 2025

The Uncertainties are for a confidence probability of approximately 95%

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Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



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

## Certificate of Testing

Cert.No.: 25TW15  
Page.: 1 of 2

Equipment : DO Meter  
Manufacturer : YSI  
Model : 5000-115V  
Serial No. : 15E102796  
ID No. : RYG\_EN0032  
Received Date : 17 January 2025  
Test Date : 20 January 2025  
Reference : 2501-0600DSC-1  
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.  
(Rayong Branch)  
616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng,  
Rayong 21140, Thailand

Laboratory Condition : Temperature (  $25 \pm 5$  ) °C  
Humidity (  $50 \pm 20$  ) %  
Test Procedure : In - house method : CP-CH9  
by Comparison Technique with Azide Modification Method

Tested by : Walalak Sirithean

Approved by :   
Approved Signatory

( ) Pornthippa Tameyakul  
( ) Ponpan Paipim  
(✓) Saithip Meangmai

Issue Date : 21 January 2025



Equipment : DO Meter with Sensor  
Condition As-Received : Used Item  
Reference : 2501-0600DSC-2  
Procedure Used :-

Cert. No.: 25LM10  
Page.: 2 of 2

Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer ( IPRT ) into Temperature Bath.  
The temperature scale used was based on ITS-90.

### Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Digital Thermometer	2188080	2411022	TPA	17 Sep 2025

2. This certificate is valid only to the item calibrated on date and place of calibration.  
3. This certification is traceable to the International System of Unit.

Remark : TPA : Technology Promotion Association ( Thailand - Japan )

Result of Calibration :- ( \* ) Without Adjustment

Function : Temperature measurement.

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

Calibration Point ( °C )	Immersion Depth ( mm )	Standard Temperature ( °C )	UUC* Reading ( °C )	Error ( °C )	Uncertainty ( $\pm$ °C )	Coverage Factor k
20.00	60	20.002	19.81	-0.192	0.15	2.00

UUC\* : Unit Under Calibration

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

-00-



Cert.No.: 25TW15  
Page.: 2 of 2

#### Condition of this result of calibration

1. Reference Standard Instruments :  
This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1. Burette	-	130BU10	23CG1172	22 Mar 2025
2. Balance	14233821	110RC001	24MM131	04 July 2025

#### 2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate 5-Hydrate AR	KEMAUS	2203162447	99.6%

**Result :** Dissolved Oxygen Meter Adjustment With Air 100 %  
Dissolved Oxygen Probe No.: 15E100464

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.20	8.20	0.0084

This report was certified only for the instrument we tested. It is allowable to use for study  
Intend to use for advertising and referral purpose is prohibited. This report may not be reproduced  
other in full, without written approval of the laboratory

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## Certificate of Calibration

Cert. No.: 24TM1663  
Page : 1 of 3

Equipment : Low Temp. Incubator

Manufacturer : Memmert

Model : IPP750

Serial No. : V818.0084

ID No. : RYG\_EN0154

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

Location : BOD Room

Received Order : 01 November 2024

Calibration Date : 01 November 2024

Ambient Temperature : (26 ± 10) °C

Relative Humidity : (50 ± 30) %

AC Line Voltage : (220 ± 22) V

Calibrated by : Krisda Malee

Approved by :

Approved Signatory

( ) Ponpan Paipim

( ) Suwit Imjai

(✓) Kunchit Promprat

Issue Date : 07 November 2024

The Uncertainties are for a confidence probability of approximately 95%

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Approval of the Head of Corporate Services 3: Equipment Calibration and Testing Services.



Equipment : Low Temp. Incubator  
Condition As-Received : Used Item  
Reference : 2411-0002OC-1

Cert. No.: 24TM1663  
Page : 2 of 3

#### Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 based on TLAS G-20 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD).  
The temperature scale used was based on ITS-90.

#### Condition of this result of calibration

##### 1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY44073381	24LM73	TPA	18 May 2025

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

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

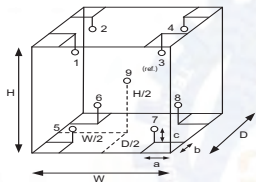
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration : ( \* ) Without Adjustment

Function of UUC\* : Temperature Source

Fresh air setting : Close

Environment during calibration		
	Beginning	Finished
Temp. (°C)	24	25
REL.Humid. (%)	55	53
AC Supply (Volt)	220	221



#### Probe Installation Details :

#### Dimension of Chamber :

a = 10 cm	D = 0.60 m
b = 10 cm	W = 1.0 m
c = 10 cm	H = 1.2 m
	Capacity = 0.72 m³

Position :	Ref. Std. ID No.:
1	1RTD-2/1
2	1RTD-2/2
3	22-01RTD-03
4	1RTD-2/4
5	1RTD-2/5
6	1RTD-2/6
7	23-01RTD-07
8	1RTD-2/8
9 (ref.)	23-01RTD-09



Equipment : Low Temp. Incubator  
Condition As-Received : Used Item  
Reference : 2411-0002OC-1  
Result of Calibration : ( \* ) Without Adjustment  
Function of UUC\* : Temperature Source  
Fresh air setting : Close

Cert. No.: 24TM1663  
Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor k
20.0	20.0	20.0	0.026	0.26	0.53	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (± °C)
	1	2	3	4	5	6	7	8	9 (ref.)	
20.0	20.071	19.915	20.273	20.179	19.977	19.782	20.056	20.026	20.033	0.30

Average\* : The average of 30 values in each position.

Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.

UUC\* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity .

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

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## Certificate of Calibration

Cert.No.: 24CG3711  
Page.: 1 of 2

Equipment : Burette  
Capacity : 50 mL  
Serial No. : -  
ID. No. : RYG\_EN0216  
Manufacturer : Witeg  
Made in : Germany  
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.  
Rayong Branch  
616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng  
Rayong 21140, Thailand

Ambient Temperature : (20 ± 2.5) °C  
Relative Humidity : (50 ± 10) %  
Barometric Pressure : 756 mmHg  
Calibration Procedure : ASTM E 542 - 01

Calibrated by : Sa-ngeunkam Wongsu

Approved by :

(✓) Srisuda Khamtha  
( ) Ponpan Paipim  
( ) Unnopphol Harachai

Issue Date : 24 September 2024

REVIEW BY *Thanitak*  
APPROVED BY *D. J. J. J.*  
NEXT CAL DATE: 24/09/25

The Uncertainties are for a confidence probability of approximately 95%

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Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Equipment : Burette  
Received Date : 19 September 2024  
Condition As-Received : Used Item  
Calibration Date : 24 September 2024  
Reference : 2409-0756DSC-3

Cert.No.: 24CG3711  
Page.: 2 of 2

### Condition of this result of calibration

#### 1. Reference Standard Instruments :

Instruments	Model	Serial No.	ID. No.	Certificate No.	Traceability	Due date
1) Balance	XP205	B134206712	140RC007	24MM316	TPA	15 July 2025
2) Data Logger	HL-20D	20683159	140EC012	23H2174	TPA	10 Oct 2024
3) Thermometer	-	1594592	140EC010	24I175	TPA	20 Feb 2025

This certification is traceable to SI Unit

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

3. True value is converted to true volume at the standard temperature of 20 °C

### Calibration result :

Nominal capacity ( mL )	Reading ( mL )	Uncertainty ( ± mL )	k Factor
10	10.0259	0.0082	2.00
20	20.0214	0.0085	2.00
30	30.0006	0.0089	2.00
40	40.0003	0.0094	2.00
50	49.9988	0.011	2.00

Remark mL = cm<sup>3</sup>

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

-00-

## SARTORIUS

Accredited by

NSC-TISI-TIS 17025  
Calibration 0426



### Calibration certificate

Calibration Certificate No. 25BKL0004

Object	Electronic non-automatic weighing instrument	This calibration certificate documents the traceability to national standards.
Manufacturer	Sartorius	Uncertainties of measurements are taken into account when only statements of compliance are made.
Type	MSE224S-100-DU	This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP WI 08.
Serial   QM Ident. no.	26207038   RYG_EN0002	This certificate relate and apply this equipment only.
Customer	ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)	
Order no.	2230	
Number of pages	4	
Date of calibration	20 Feb 2025	

REVIEW BY *Thanitak*  
APPROVED BY *D. J. J. J.*  
NEXT CAL DATE: 20/02/26

This calibration certificate may not be reproduced other than in full except with the permission of NSC-TISI-TIS-17025 and the issuing laboratory. Calibration certificates without signature are not valid.

The user is obliged to have the object recalibrated at appropriate intervals.

Date 06 Mar 2025 Approval of the Calibration Certificate

*ewi*

Mr. Chonchai Inthana

Person in charge

*Kachen*

Kachen Lalee

Calibration certificate No.: 25BKL0004

Calibration Certificate

### Calibration object

#### Single range instrument

Model MSE224S-100-DU  
Serial Number 26207038  
QM Ident. no | Inventory no. RYG\_EN0002 | ---

Maximum capacity (Max. load) 220.0000 g  
Measured range 220.0000 g  
Scale interval 0.0001 g

### Place of calibration

Address According to page 1  
Department | Cost center Laboratory Department. | ---  
Building | Floor --- | 1st Floor.  
Room Balance Room.  
Maximum temperature variation at place of calibration 5 K

### Calibration procedure

EURAMET cg-18, V4.0 - Guidelines on the Calibration of Non-Automatic Weighing Instruments

### Test equipment

Test equipment type	Test equipment ID	Valid until
Thermometer	MHB-382SD s/nB011342 Traceable to SI unit through DKSH	21 Aug 2025
Test weight set OIML R111 E2	Certificate No.M2308197S .E2(Traceable to SI unit through TCS)	23 Aug 2025

### Adjustment Status

The measuring device was internally adjusted before the calibration.

### Environmental and measuring conditions

Date of calibration 20 Feb 2025  
Temperature at place of calibration | Temp. diff. 24.4 °C | 0.6 K  
Weights - T place  
Measuring conditions The installation site is suitable. The device was levelled. Balance was loaded up to Max before test.  
Comments Humidity 50.2 %RH.

### Measurement results | Measurement uncertainties

Repeatability		Eccentricity	
Test load (nominal): 10 g   200 g		Test load (nominal): 100 g	
10 g	200 g	100 g	
1	10.0000 g	200.0000 g	100.0000 g
2	10.0000 g	200.0001 g	99.9998 g
3	10.0001 g	200.0001 g	100.0000 g
4	10.0000 g	200.0000 g	100.0000 g
5	10.0001 g	200.0000 g	100.0000 g
6	10.0001 g	200.0001 g	100.0000 g
7	10.0000 g	200.0000 g	100.0000 g
8	10.0000 g	200.0001 g	100.0000 g
9	10.0001 g	200.0000 g	100.0000 g
10	10.0000 g	200.0000 g	100.0000 g
s = 0.00005 g		s = 0.00005 g	

Testload	Indication	Error	Expansion factor	Uncertainty	Uncertainty relative
L	I	E	k	U(E)	U <sub>rel</sub> (E)
0.0100 g	0.0100 g	0.0000 g	2.00	0.00013 g	1.3 %
0.1000 g	0.1000 g	0.0000 g	2.00	0.00013 g	0.13 %
0.5000 g	0.5000 g	0.0000 g	2.00	0.00013 g	0.027 %
1.0000 g	1.0000 g	0.0000 g	2.00	0.00013 g	0.013 %
5.0000 g	5.0000 g	0.0000 g	2.00	0.00014 g	0.0027 %
10.0000 g	10.0000 g	0.0000 g	2.00	0.00014 g	0.0014 %
20.0000 g	20.0000 g	0.0000 g	2.00	0.00014 g	0.00072 %
50.0000 g	50.0000 g	0.0000 g	2.00	0.00016 g	0.00032 %
100.0000 g	100.0001 g	0.0001 g	2.00	0.00021 g	0.00021 %
200.0000 g	200.0000 g	0.0000 g	2.00	0.00034 g	0.00017 %
220.0000 g	220.0000 g	0.0000 g	2.00	0.00039 g	0.00018 %
Maximum error of indication		E  <sub>max</sub> = 0.0001 g			

U<sub>rel</sub>(E) is the quotient of U(E) and test load L. The uncertainty of measurement U(E) is valid only if error E is considered. You will find reference notes on the uncertainty of measurement in use under: Appendix to the calibration certificate | Interpretation of measurement results.  
Reference note: The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the documented Expansion factor, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

End of calibration certificate

## Uncertainty of measurement in use

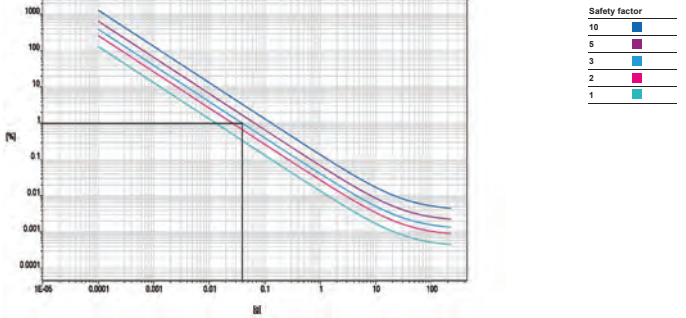
Device adjusted before measurement Yes  
Temperature deviation considered 1.5 K (isoCAL active)  
Temperature coefficient considered 1 · 10<sup>-4</sup> /K

Uncertainty of the weighing result U<sub>g</sub>(W) U<sub>g</sub>(W) = 0.00013 g + 3.95 · 10<sup>-4</sup> · R

Reference note: The current uncertainty of measurement is calculated by entering the reading R into this formula. In relation to this, there is no need for a correction of the indication error. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied with an Expansion factor of 2, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

Indication in % from max load	Net indication	Uncertainty	Uncertainty relative
	R	U <sub>g</sub> (W)	U <sub>g</sub> (W) <sub>rel</sub>
1 %	2.2000 g	0.00014 g	0.0063 %
25 %	55.0000 g	0.00035 g	0.00063 %
50 %	110.0000 g	0.00056 g	0.00051 %
75 %	165.0000 g	0.00078 g	0.00047 %
100 %	220.0000 g	0.00100 g	0.00045 %

### Graphic realization of the relative uncertainty of measurement | process accuracy



### Displayed example

Process accuracy 1.00 %  
Safety factor 3  
Minimum sample weight 0.0395 g



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## Certificate of Calibration

Cert. No.: 24TM632  
Page: 1 of 3

Equipment : Hot Air Oven  
Manufacturer : Memmert  
Model : UFE 500  
Serial No. : G511.1572  
ID No. : RYG\_EN0010  
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)  
616/10 Moo 5 T. Maenam Khu,  
A. Pluakdaeng,  
Rayong 21140 Thailand  
Location : Oven Room  
Received Order : 21 March 2024  
Calibration Date : 21 March 2024  
Ambient Temperature : ( 26 ± 10 ) °C  
Relative Humidity : ( 50 ± 30 ) %  
Calibrated by : Man Pattanapongpaiboon  
Approved by :  
( ) Pornthippa Tameyakul  
( ) Unnophol Harachai  
(✓) Suwit Imjai  
Issue Date : 22 March 2024

REVIEW BY: *Thanitak*  
APPROVED BY: *D. Pannas*  
NEXT CAL DATE: 21/09/25

The Uncertainties are for a confidence probability of approximately 95%

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Equipment : Hot Air Oven  
Condition As-Received : Used Item  
Reference : 2403-0563OC-1  
Procedure Used :-

Cert. No.: 24TM632  
Page : 2 of 3

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector ( RTD ) and Thermocouple Type T.  
The temperature scale used was based on ITS-90.

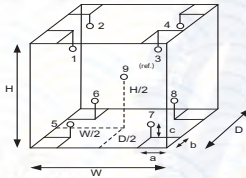
### Condition of this result of calibration

- Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1 ) Data Acquisition	MY57013711	23LM115	TPA	11 Jul 2024
- This certificate is valid only to the item calibrated on date and place of calibration.
- This certification is traceable to the International System of Unit.

Remark : TPA : Technology Promotion Association ( Thailand - Japan )  
Result of Calibration :- ( \* ) Without Adjustment  
Function of UUC : Temperature Source  
Fresh air setting : Close

Environment during calibration		
	Beginning	Finished
Temp. ( °C )	27	27
REL.Humid. ( % )	57	59
AC Supply ( Volt )	222	224



Probe Installation Details :  
a = 5.0 cm  
b = 5.0 cm  
c = 5.0 cm  
Dimension of Chamber :  
D = 0.40 m  
W = 0.56 m  
H = 0.48 m  
Capacity = 0.11 m<sup>3</sup>

Ref. Std. ID No.: @ Calibration Point		
Position :	( 180 ) °C	( 104 ) °C
1	18-18TC-01	18-18RTD-01
2	18-18TC-02	18-18RTD-02
3	18-18TC-03	18-18RTD-03
4	18-18TC-04	18-18RTD-04
5	18-18TC-05	18-18RTD-05
6	18-18TC-06	23-18RTD-06
7	18-18TC-07	18-18RTD-07
8	18-18TC-08	22-18RTD-08
9 (ref.)	18-18TC-09	18-18RTD-09





Equipment : Hot Air Oven  
Condition As-Received : Used Item  
Reference : 2403-05630C-1  
Result of Calibration :- ( \* ) Without Adjustment  
Function of UUC\* : Temperature Source  
Fresh air setting : Close

Cert. No.: 24TM632  
Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor k
104.0	104.0	104.0	0.051	0.59	0.62	2
180.0	180.0	180.0	0.15	1.3	1.7	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (± °C)
	1	2	3	4	5	6	7	8	9 (ref.)	
104.0	103.921	103.786	103.757	103.759	103.950	103.817	104.213	103.672	103.673	0.42
180.0	179.614	179.270	179.145	179.599	180.001	180.423	180.293	180.629	179.429	1.1

Average\* : The average of 30 values in each position.

Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.

UUC\* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity .

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

-00-



Metrology  
SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand  
Saraburi Tel : +66 3627 3096 Fax : +66 3627 3100  
Bangkok Tel : +668 9205 6851 , +669 8247 2360  
Website : www.scieco.co.th E-Mail : calibrate@scg.com



Certificate No. T250454

Page 1 of 3

## Certificate of Calibration

Equipment : Chamber ( Oven )

Manufacturer : MEMMERT

Model : UF 110

Serial No. : B423.0853

Customer Code : RYG\_EN0213

ID No. : T5884A5

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

616/10 Moo 5 T.Maenam Khu,

A.Pluakdaeng, Rayong 21140

Customer Location : ENVIRONMENT LABORATORY

Date of Receipt : 12 March 2025

Calibrated By : Sujjar Nakkakred ( Site Calibration Manager )

Approved By : Boonchai Suriyawong (Site Calibration Manager)

Date of Issue : 21 MAR 2025

The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrology.

FM-L14 I18/18-08-66



Metrology  
SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand.



Certificate No. T250454

Page 2 of 3

## Calibration Report

Equipment : Chamber ( Oven )  
Date of Calibration : 19 March 2025  
Environment : Temperature : 26.5-26.9 °C  
Line Voltage : 223.9-231.3 V  
Relative Humidity : 55 - 65 %RH

### Condition of this results of calibration :

1. This equipment was calibrated by insert nine resistance thermometer detectors into its chamber , the other one resistance thermometer detector use for ambient temperature measurement . The calibration was done in according to WI-T20 ( based on ASTM E145-94 ( Reapproved 2019 ) and AS2853-1986 ). All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .

### 2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
RTD	100 ohm	27-(CH1-10)	T240709	19 April 2025
DATA LOGGER	34970A	T149	T240709	19 April 2025

### 3. This certificate is traceable to :

National Institute of Metrology ( Thailand ) through Metrological Center ( NSC-TISI-TIS 17025 CALIBRATION 0244 )

### 4. Condition of calibrated item : good

#### Equipment Description :

Time Constant : 1 Hour 44 Minute At 104 °C  
Fresh Air Damper : ☐ Open ☐ Min ☐ Medium ☒ Max  
☒ Close  
☐ Not Available

### 5. Adjustment :

( ) without adjustment ( X ) after adjustment

Approved By:

FM-L15 I18/18-08-66



Metrology  
SCI ECO Services Company Limited

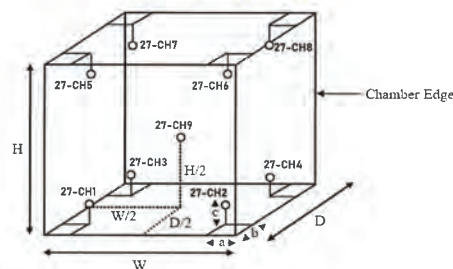
33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand.



Certificate No. T250454

Page 3 of 3

## Calibration Report



Remark : Internal Dimensions of Chamber : W (Width) = 56 cm , H (Height) = 48 cm and D (Depth) = 40 cm.  
Size of installed Standard sensor number 27-CH1 to number 27-CH8 : a = 5 cm , b = 5 cm and c = 5 cm  
Size of installed Standard sensor number 27-CH9 : W/2 = 56 cm /2 , H/2 = 48 cm /2 and D/2 = 40 cm /2

### Measurement Results

Average Standard Reading at each position (°C)									
Calibration Point	27-CH1	27-CH2	27-CH3	27-CH4	27-CH5	27-CH6	27-CH7	27-CH8	27-CH9
104	103.84	104.10	104.10	104.48	103.73	104.14	103.95	103.57	104.22
180	179.41	179.92	180.80	181.37	179.54	179.52	179.82	179.41	180.31

Chamber ( Oven )			Temperature Distribution				
Setting °C	Reading (°C)		Average (°C)	Stability (± °C)	Uniformity (°C)	Uncertainty (± °C)	Coverage Factor k
	Min	Max					
104.0	103.9	104.1	104.0	0.08	0.65	0.42	2.00
180.0	-	180.0	180.01	0.17	1.26	0.49	2.00

\* The quoted uncertainty exclude "uniformity"

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which for a t-distribution, providing a level of confidence of approximately 95 % .

End of Certificate.

Approved By:

FM-L15 I18/18-08-66



## Certificate of Calibration

Cert. No.: 24TM635  
Page : 1 of 3

Equipment : Water Bath  
Manufacturer : Memmert  
Model : WNB22  
Serial No. : L513.0648  
ID No. : RYG\_EN0081

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

Received Order : 21 March 2024  
Calibration Date : 21 March 2024  
Ambient Temperature :  $(26 \pm 10) ^\circ\text{C}$   
Relative Humidity :  $(50 \pm 30) \%$

Calibrated by : Man Pattanapongpaiboon

Approved by :

( ) Pornthippa Tameyakul  
( ) Unnophol Harachai  
(✓) Suwit Imjai

Issue Date : 23 March 2024

The Uncertainties are for a confidence probability of approximately 95%

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

REVIEW BY *Thanitak*  
APPROVED BY *D. Pongpaiboon*  
NEXT CAL DATE: 21/09/25



Equipment : Water Bath  
Condition As-Received : Used Item  
Reference : 2403-0563OC-4  
Procedure Used :-

Cert. No.: 24TM635  
Page : 2 of 3

Calibration were conducted using in-house calibration procedure CP-OT04 Based on ASTM E715 according to direct measurement method with Data Acquisition which connected with Industrial Platinum Resistance Thermometer ( IPRT ).

The temperature scale used was based on ITS-90.

### Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1 ) Data Acquisition	MY57013711	23LM115	TPA	11 Jul 2024

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

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

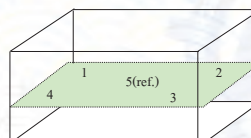
Remark : TPA : Technology Promotion Association ( Thailand - Japan )

Result of Calibration :- ( \* ) Without Adjustment

Function of UUC\* : Temperature Source

Heat transfer medium used : Water

	Environmental		AC Voltage Supply
	( $^{\circ}\text{C}$ )	( %R.H. )	( Volt )
Beginning of Calibration	25	55	222
Finished of Calibration	25	57	223



Front

Position :	Ref. Std. ID No.:
1	4803988-001
2	4803988-002
3	4803988-003
4	4803988-004
5(ref.)	4803988-005



Equipment : Water Bath  
Condition As-Received : Used Item  
Reference : 2403-0563OC-4  
Result of Calibration :- ( \* ) Without Adjustment  
Function of UUC\* : Temperature Source

Cert. No.: 24TM635  
Page : 3 of 3

Calibration point ( $^{\circ}\text{C}$ )	UUC* Setting ( $^{\circ}\text{C}$ )	UUC* Reading ( $^{\circ}\text{C}$ )	Average* Standard Reading ( $^{\circ}\text{C}$ )					Uncertainty ( $\pm ^{\circ}\text{C}$ )
			1	2	3	4	5 (ref.)	
85.0	85.0	85.0	84.428	84.424	84.489	84.507	84.477	0.18

Calibration point ( $^{\circ}\text{C}$ )	Uniformity ( $^{\circ}\text{C}$ )	Stability ( $\pm ^{\circ}\text{C}$ )	Coverage Factor k
85.0	0.19	0.11	2

Average\* : The average of 30 values in each position.

Uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Stability : One-half of the greatest maximum difference of measured temperature at any one probe.

UUC\* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity.

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

-oOo-



## ภาคผนวก จ

สำเนาหนังสือใบอนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน



ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๐ พฤศจิกายน ๒๕๖๖

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๔ สิงหาคม ๒๕๖๖

- สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น  
๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ แผ่น  
๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุหนังสือ  
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐  
ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด  
ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

- ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย ตามสิ่งที่ส่งมาด้วย ๑  
ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ ๑๘๑ ราย ตามสิ่งที่ส่งมาด้วย ๒  
ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย สิ่งปฏิกูล  
หรือวัสดุที่ไม่ใช่แล้ว และดิน ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ กันยายน ๒๕๖๙ หากประสงค์จะต่ออายุหนังสือ  
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้อื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อ  
กรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายจิระ จันทรเจิด)

นักวิทยาศาสตร์เชี่ยวชาญ วิชาการการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปฏิบัติราชการตามอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๔๔

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



สิ่งที่ส่งมาด้วย ๑

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย

- |                              |                            |
|------------------------------|----------------------------|
| ๑) นางสาวยุพาพร จันทรเปล่ง   | ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๑ |
| ๒) นางสาวชนัญ โภมารกุล ณ นคร | ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๒ |
| ๓) นายศรายุทธ จิตรานนท์      | ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๓ |
| ๔) นางสาวกนกกร เอนก          | ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๔ |
| ๕) นายสุริยา สอนแก้ว         | ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๕ |
| ๖) นายวิชาญ ชุมหรัตน์        | ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๖ |

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบลอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๘๑ ราย

- ๑) นายกาบบัณฑิต กิตติคุณาณิษฐ์
- ๒) นายภัทรพล สว่างใจธรรม
- ๓) นายณราธิป เทือกชัยคำ
- ๔) นายศิริโชค พงษ์ประสม
- ๕) นายณัฐวุฒิ ด่วงแพง
- ๖) นางสาวจินดา ไชจุลธรรม
- ๗) นางสาวสิริวัตร น้อยเสงี่ยม
- ๘) นางสาวชนัญญาณูจน์ อัมม
- ๙) นางสาวนรินทร์ สายเส็ง
- ๑๐) นางสาวนันทวิ สมบูรณ์
- ๑๑) นางสาวศรณียา เฉลิมธำรงค์
- ๑๒) นางสาวธัญญธร มงคลจิรวุฒิ
- ๑๓) นางสาวศิริลักษณ์ บุญนาค
- ๑๔) นายณพพงศ์ จันทร์พันธุ์
- ๑๕) นายนรเศรษฐ์ โกมลาลัย
- ๑๖) นายธินา จริยา
- ๑๗) นางสาวเกศรินทร์ แก้วมัน
- ๑๘) นางสาวสุวิมล ชัยเรืองวุฒิ
- ๑๙) นางสาวสุชาดา ธรรมถาวร
- ๒๐) นางสาวเปรมิกา ชัยเดชธนกุล
- ๒๑) นางสาวศศิธร หมุสสวัสดิ์
- ๒๒) นางสาวเสาวลักษณ์ ภูณภาอำพร
- ๒๓) นายอภิสิทธิ์ สิงหา
- ๒๔) นายศักดิ์สิทธิ์ ไพศาลพิสุทธิ
- ๒๕) ว่าที่ร้อยตรีหญิง พรรณีภา ขำเจริญ
- ๒๖) นางจิตดา คำแก้ว
- ๒๗) นางสาวอรรณณ รักยง
- ๒๘) นางสาวนพรัตน์ แยมกรานต์
- ๒๙) นายจุลเดช วารินทร์
- ๓๐) นางสาวดาญรัตน์ รื่องคำ
- ๓๑) นายพรมมี ศรีปัตเนตร
- ๓๒) นายอุทิศ อุ่นลิ้ม
- ๓๓) ว่าที่ร้อยตรี เฉลิมเกียรติ ออมศรีเสริม
- ๓๔) นางสาววริยา สร้างนา
- ๓๕) นายอนุพงศ์ รัตนศรีประเสริฐ

- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๑
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๒
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๓
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๔
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๕
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๖
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๗
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๘
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๙
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๐
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๑
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๒
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๓
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๔
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๕
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๖
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๗
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๘
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๙
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๐
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๑
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๒
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๓
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๔
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๕
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๖
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๗
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๘
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๙
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๐
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๑
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๒
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๓
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๔
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๕

31/11

๓๖) นางสาวจุฑารัตน์...

- ๓๖) นางสาวจุฑารัตน์ โอนสันเทียะ
- ๓๗) นางสาวจารุวรรณ พิมพ์ภักดิ์
- ๓๘) นางสาวปรานีทิพย์ กิจไพศาลศักดิ์
- ๓๙) นางสาวเตือนใจ ทางกลาง
- ๔๐) นางสาวจิราพร ศิริเวช
- ๔๑) นายวรากร ผูกกริช
- ๔๒) นายทงก วัริยะสทกิจ
- ๔๓) นายธนิศ เจนจบ
- ๔๔) นายคณิศร ขำเพชร
- ๔๕) นายภูวิช พรหมสะอาด
- ๔๖) นายธนเดช โภคาพิพัฒน์
- ๔๗) นายชวฤทธิ์ วงษ์จันทร์
- ๔๘) นายอาทิตย์ ศรีเสน
- ๔๙) นายเจตตินทร์ คงศักดิ์ไทย
- ๕๐) นายจรัส บุญยิ่ง
- ๕๑) นายธนาภิต เอนก
- ๕๒) นายอภิวัฒน์ ทุมหนู
- ๕๓) นางสาวสุภาภาวัญ มาก
- ๕๔) นางสาวทัตพร ขวาลสมบูรณ์
- ๕๕) นางสาวธิดิมา บุญเพ็ง
- ๕๖) นางสาวภาณุมาศ นามวัฒน์
- ๕๗) นางสาวอุไรรัตน์ ทั่งสร้างแป้น
- ๕๘) นายธีรวัฒน์ ปวงสุข
- ๕๙) นายอิทธิพล ยะใส
- ๖๐) นายประพจน์ วรรณชูชัย
- ๖๑) นายชยธร พวงทิพย์
- ๖๒) นางสาวกนกวรรณ จันทบาล
- ๖๓) นายสิทธิโชค ธงเงิน
- ๖๔) นางศิลาวรรณ ใจบุญ
- ๖๕) นางสาวพรรณธิดา ทุมคง
- ๖๖) นายณวัชร ศรีวัริยะ
- ๖๗) นายสุวิชา ทองอ่อน
- ๖๘) นายวิญญู บุญตะนัย
- ๖๙) นายสมบูรณ์ บุตรจันทร์
- ๗๐) นายวิรัตน์ ไชยชนะรา
- ๗๑) นายณนุเบศน์ เพิ่มพูน
- ๗๒) นายจิณัฐ ขวาละออ
- ๗๓) นายอัสริ นามบุรี
- ๗๔) นายอัครเดช จ่อสาว

- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๖
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๗
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๘
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๙
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๐
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๑
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๒
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๓
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๔
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๕
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๖
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๗
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๘
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๙
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๐
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๑
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๒
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๓
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๔
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๕
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๖
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๗
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๘
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๙
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๐
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๑
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๒
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๓
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๔
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๕
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๖
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๗
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๘
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- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๐
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- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๓
- ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๔

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๓๕) นายประเสริฐ...



๗๕) นายประเสริฐ สุระขันธุ์  
๗๖) นายบุญล จันทรเนียม  
๗๗) นายพิรพงษ์ ทองคุณปรีดา  
๗๘) นายณฤพล ทองนุช  
๗๙) นายอนุวัฒน์ ม่วงแพ  
๘๐) นายเจตศราวุฒิ ปิตตะมะ  
๘๑) นายกฤษณะ สายวรรณ  
๘๒) นายพิชัย บุญยงค์  
๘๓) นายภาณุพงศ์ โยมวงศ์  
๘๔) นายสามารถ คุ้มปลี  
๘๕) นายสฤษดิ์ โกศรีนาม  
๘๖) นายณัฐวุฒิ ศรีประเสริฐ  
๘๗) นายขวัญชัย นาคพนม  
๘๘) นายพงษ์ธร ชัยทิพย์  
๘๙) นายสิทธิโชค ทาสีดา  
๙๐) นายธนากร อินสุตา  
๙๑) นางสาววรรณิษา ขาดีวันชัย  
๙๒) นางสาวพิมพ์ตะวัน มีนากุล  
๙๓) นางสาวเพชรรัตน์ สิงห์สมบุญ  
๙๔) นางสาวชญาณี นพพรจันทร์  
๙๕) นายกิตติ ทวีราช  
๙๖) นายจักริน หมั่นวิชา  
๙๗) นายฉัตรชัย สุขเปี้ย  
๙๘) นายณรนนท์ ด๊ะทองคำ  
๙๙) นายศุภพล สมนอก  
๑๐๐) นายทักษ์ดนัย อุบลศรี  
๑๐๑) นายธนศร นามะคุณณา  
๑๐๒) นายธิตีพงศ์ บัวแดง  
๑๐๓) นายณนทชัย อุปถัมภ์  
๑๐๔) นายณัฐพล คุณสุทธิ  
๑๐๕) นายณัฏฐ์ สารี  
๑๐๖) นายปิยะนัฐ พลมะศรี  
๑๐๗) นายพงศ์สิริ โสมเขียว  
๑๐๘) นายพีรพัฒน์ กำคำ  
๑๐๙) นายภาณุพงศ์ มานิตย์  
๑๑๐) นายมงคล ผลาทิพย์  
๑๑๑) นายสิรินันท์ ทองอ้น  
๑๑๒) นายอเนชา พันสมัย  
๑๑๓) นายอดิศักดิ์ สมเฒ

ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๐๗๕  
ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๐๗๖  
ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๐๗๗  
ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๐๗๘  
ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๐๗๙  
ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๐๘๐  
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ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๐๘๒  
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ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๐๘๕  
ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๐๘๖  
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ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๑๒  
ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๑๓

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๑๑๔) นายอนันต์ชัย...

๑๑๔) นายอนันต์ชัย วิสม  
๑๑๕) นายวราวุธ ดินัก  
๑๑๖) นายแสงตะวัน นະตะลัต  
๑๑๗) นายยุทธพงศ์ รัตนะ  
๑๑๘) นายชัยวุฒิ ไชยชนะ  
๑๑๙) นายวิศรุต ศรีธรรมมา  
๑๒๐) นายณนทกร เผือกผ่อง  
๑๒๑) นายคำชัย สุทธะ  
๑๒๒) นางสาวณัฐภรณ์ บุญตะนัย  
๑๒๓) นางสาวพัชรินทร์ แสนสร้อย  
๑๒๔) นายไพโรจน์ เปี่ยมพินาย  
๑๒๕) นางสาวศุภมาศ ทองมาก  
๑๒๖) นางสาวลลิตา จิตรสว่าง  
๑๒๗) นางสาวไมพร เล็กภูเขียว  
๑๒๘) นางสาวกฤติมาพร คำมีแก่น  
๑๒๙) นางสาวสกุลรัตน์ ภาคภูมิ  
๑๓๐) นางสาวไพรินทร์ ศรีรูปี  
๑๓๑) นางสาวทิพนทร พุฒปัญญา  
๑๓๒) นางสาวสาธิตา ปานทอง  
๑๓๓) นางสาวอริสา ทองนวล  
๑๓๔) นางสาวอรรษา คำคล้อง  
๑๓๕) นางสาวชุตติภากรณ สุพรรณาน  
๑๓๖) นางสาวอัญชลี คำจันทร์  
๑๓๗) นายบุญฤทธิ์ เอี่ยมเทศ  
๑๓๘) นางสาวศุภรดา ปันมยุรา  
๑๓๙) นางสาวพาดิ คุณานาน  
๑๔๐) นางสาวจิราเจต พองดา  
๑๔๑) นางสาวอารยา มีชัย  
๑๔๒) นางสาววิชชุดา นาคผจญ  
๑๔๓) นางสาวนันทิยา จันทะสุน  
๑๔๔) นายกิตติพงศ์ แซ่ลี  
๑๔๕) นายอนุวัติ ภูถวิล  
๑๔๖) นายธีรพล แสงทอง  
๑๔๗) นายศักดิ์พัฒน์ บุญมัน  
๑๔๘) นายธิตินันท์ เอมอไร  
๑๔๙) นายชัยณรงค์ ศรีบุรินทร์  
๑๕๐) นางสาวอัจฉราวรรณ สานสนอง  
๑๕๑) นางสาวณัฐพร สิงหา  
๑๕๒) นายกัมเมศ แหยมโต

ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๑๔  
ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๑๕  
ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๑๖  
ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๑๗  
ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๑๘  
ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๑๙  
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ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๕๑  
ทะเบียนเลขที่ ๖-๒๐๔-จ-๐๑๕๒

31/10/2564

๑๕๓) นางสาวอุบล...

๑๕๓) นางสาวอุบล เคิกศิริ  
๑๕๔) นางสาวมโนรัตน์ ทองบุตร  
๑๕๕) นายภาณุภูมิ แทนไทย  
๑๕๖) นางสาวสุภาภรณ์ เมล่พ่วง  
๑๕๗) นางสาวพรทิศา สาดาชนม์  
๑๕๘) นายเอกวิทย์ วันทะนา  
๑๕๙) นายไตรมณฑล ทิพย์วรรณ  
๑๖๐) นายจิรเมธ ประเสริฐศิริพงศ์  
๑๖๑) นายจิรายุส เกษมสุข  
๑๖๒) นายจิรศักดิ์ ศรีวิชัย  
๑๖๓) นายณัฐกฤษณ์ สะพานแก้ว  
๑๖๔) นายบุญศักดิ์ ปะที  
๑๖๕) นายปณณวิญญ์ เสมอทรัพย์  
๑๖๖) นายพิษณุพงษ์ ไชยา  
๑๖๗) นายภัทรพงษ์ มณฑาทอง  
๑๖๘) นายวสันต์ ตรีนกุล  
๑๖๙) นายภาณุเดช เพชรอุด  
๑๗๐) นายอนุกุล วิเศษแสง  
๑๗๑) นายภัทรพงษ์ มีสุข  
๑๗๒) นางสาวนุชวี ลีละทิป  
๑๗๓) นางสาวสุภาวดี โกศรินาม  
๑๗๔) นางสาวอรรณพ เทียนคำ  
๑๗๕) นางสาวพรเพ็ญ ชอบสอน  
๑๗๖) นางสาววันวิสา ขอนทิกุล  
๑๗๗) นางสาวอรรณพ เถาว์ทอง  
๑๗๘) นางสาวอัยยลิณ เมอร์วิณณ์  
๑๗๙) นางสาววิสรา ค่อยครอง  
๑๘๐) นายวุฒิกกร ศิริวรรณ  
๑๘๑) นางสาวจรรววรรณ กระจำพันธุ

ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๓  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๔  
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ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๑

วิมล

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔  
ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๗๔ รายการ  
น้ำเสีย จำนวน 60 รายการ

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



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
19	Copper	1) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(4)</sup>
20	Cyanide	Distillation, Colorimetric Method <sup>(4)</sup>
21	2,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
22	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
23	2,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
24	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
25	2,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
26	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
27	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
28	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
29	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
30	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
31	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
32	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
33	Formaldehyde	Distillation, Colorimetric Method <sup>(3)</sup>
34	Free Chlorine	1) DPD Ferrous Titrimetric Method <sup>(4)</sup> 2) DPD Colorimetric Method <sup>(4)</sup>
35	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
36	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
37	Hexavalent Chromium	Colorimetric Method <sup>(4)</sup>
38	3-Hydroxycarbofuran	High-Performance Liquid Chromatographic Method <sup>(4)</sup>
39	Lead	1) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(4)</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
40	Manganese	1) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(4)</sup>
41	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass spectrometric Method <sup>(4)</sup>
42	Methiocarb	High-Performance Liquid Chromatographic Method <sup>(4)</sup>
43	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
44	Methomyl	High-Performance Liquid Chromatographic Method <sup>(4)</sup>
45	Nickel	1) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(4)</sup>
46	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method <sup>(4)</sup> 2) Soxhlet Extraction Method <sup>(4)</sup>
47	Oxamyl	High-Performance Liquid Chromatographic Method <sup>(4)</sup>
48	Propoxur	High-Performance Liquid Chromatographic Method <sup>(4)</sup>
49	pH	Electrometric Method <sup>(4)</sup>
50	Phenols	1) Distillation, Chloroform Extraction Method <sup>(4)</sup> 2) Distillation, Direct Photometric Method <sup>(4)</sup>
51	Selenium	1) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(4)</sup>
52	Sulfide	Iodometric Method <sup>(4)</sup>
53	Temperature	Laboratory and Field Methods <sup>(4)</sup>
54	Total Dissolved Solids	Dried at 180 °C <sup>(4)</sup>
55	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method <sup>(4)</sup>
56	Total Phosphorous	Digestion, Colorimetric Method <sup>(4)</sup>
57	Total Suspended Solids	Dried from 103-105 °C <sup>(4)</sup>
58	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
59	Trivalent Chromium	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation <sup>(4)</sup>
60	Zinc	1) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(4)</sup>



น้ำใต้ดิน จำนวน 126 รายการ

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

18 Bis(2-ethylhexyl)phthalate...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(4)</sup>
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
27	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
33	Chromium	1) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(4)</sup>
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation <sup>(4)</sup>
35	Chromium (VI)	Colorimetric Method <sup>(4)</sup>

36 Chrysene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
36	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
37	Cyanide	Distillation, Colorimetric Method <sup>(4)</sup>
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
39	DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
40	DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
41	DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
42	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
43	Di-n-Butyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
47	3,3-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
57	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
58	Diethyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
63	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
64	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
65	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
69	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
70	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
74	α-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
75	β-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
76	γ-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
81	Lead	1) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(4)</sup>
82	Manganese	1) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(4)</sup>
83	Mercury	1) Digestion, Cold Vapor Atomic Absorption Spectrometric Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(4)</sup>
84	Methanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
86	Methyl bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
87	Methylene chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
90	Methyl tert-butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
92	Nickel	1) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(4)</sup>
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
95	N-Nitrosodi-n-Propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB 1242 - PCB 1248 - PCB 1254 - PCB 1260	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
98	pH	Electrometric Method <sup>(4)</sup>
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
100	Phenol	1) Distillation, Chloroform Extraction Method <sup>(4)</sup> 2) Distillation, Direct Photometric Method <sup>(4)</sup> 3) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
102	Selenium	1) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(4)</sup>
103	Silver	1) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(4)</sup>
104	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
105	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
106	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
107	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
108	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
109	TPH (C <sub>8</sub> -C <sub>16</sub> )	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(14,25)</sup>



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
110	TPH (C <sub>8</sub> -C <sub>16</sub> )	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(9,22)</sup>
111	TPH (C <sub>16</sub> -C <sub>35</sub> )	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(9,22)</sup>
112	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
113	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
114	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
115	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
118	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
119	Vanadium	1) Digestion, Inductively Coupled Plasma Method <sup>(2)</sup> 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(4)</sup>
120	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
121	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
122	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
123	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
124	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
125	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
126	Zinc	1) Digestion, Inductively Coupled Plasma Method <sup>(2)</sup> 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(4)</sup>

อากาศเสีย (ปล่องระบาย) จำนวน 28 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
2	Arsenic	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(5)</sup> 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
3	Beryllium	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(5)</sup> 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
4	Cadmium	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(5)</sup> 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
5	Carbon Monoxide	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(5)</sup> 1) Instrumental Analyzer Method <sup>(5)</sup>
6	Chlorine	2) Sampling Bag Non-Dispersive Infrared Method <sup>(5)</sup> 1) Absorption Sampling, Ion Chromatographic Method <sup>(5)</sup>
7	Chromium	2) Isokinetic Sampling, Ion Chromatographic Method <sup>(5)</sup> 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
8	Cobalt	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(5)</sup> 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
9	Copper	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(5)</sup> 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
10	Cresol	Adsorption Sampling, Gas Chromatographic Method <sup>(5)</sup>
11	Dioxins	Isokinetic Sampling <sup>(5)</sup>
12	Hydrogen Chloride	1) Absorption Sampling, Ion Chromatographic Method <sup>(5)</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>(5)</sup>
13	Hydrogen Fluoride	1) Absorption Sampling, Ion Chromatographic Method <sup>(5)</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>(5)</sup>
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method <sup>(5)</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
15	Lead	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
16	Manganese	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
17	Mercury	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method <sup>[5]</sup>
18	Nickel	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
19	Opacity	Ringelmann's Method <sup>[2]</sup>
20	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method <sup>[5]</sup> 2) Absorption Sampling, Alkaline Permanganate/Colorimetric Method <sup>[5]</sup> 3) Instrumental Analyzer Method <sup>[5]</sup>
21	Selenium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
22	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method <sup>[5]</sup> 2) Instrumental Analyzer Method <sup>[5]</sup>
23	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method <sup>[5]</sup>
24	Tellurium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
25	Tin	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
26	Total Suspended Particulate	1) Isokinetic Sampling, Gravimetric Method <sup>[5]</sup> 2) Paired Train, Isokinetic Sampling, Gravimetric Method <sup>[5]</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Vanadium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
28	Xylene	Adsorption Sampling, Gas Chromatographic Method <sup>[5]</sup>

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,26]</sup>
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,17]</sup>
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,17]</sup>
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,17]</sup>



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(1,6,17)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(7,17)</sup>
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(1,6,17)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(7,17)</sup>
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,26)</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,26)</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,26)</sup>
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(1,6,17)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(7,17)</sup>
9	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method <sup>(1,6,16,19)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method <sup>(1,6,17,19)</sup> 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>(7,8,16,19)</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>(7,8,17,19)</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method <sup>(1,6,19)</sup> 2) Alkaline Digestion, Colorimetric Method <sup>(8,19)</sup>
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(1,6,17)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(7,17)</sup>
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(1,6,17)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(7,17)</sup>
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,26)</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,26)</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,26)</sup>
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,26)</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,26)</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,26)</sup>
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,26)</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,26)</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,26)</sup>
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,26)</sup>



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup> 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,26)</sup> 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,26)</sup> 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,26)</sup> 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
20	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(1,6,17)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(7,17)</sup>
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,26)</sup> 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(1,6,20)</sup> 2) Waste Extraction, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method <sup>(1,6,30)</sup> 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(20)</sup> 4) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method <sup>(30)</sup> 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method <sup>(21)</sup>
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,26)</sup> 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,26)</sup> 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
25	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(1,6,17)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(7,17)</sup>
26	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>(1,6,17)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(7,17)</sup>
27	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,26)</sup> 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>

31 Silver...

ดิน...



คืน จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
2	Acetone	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup> 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method <sup>(13)</sup>
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
4	Anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
5	Antimony	1) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(7,17)</sup>
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(7,17)</sup>
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
8	Barium	1) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(7,17)</sup>
9	Benz(a)anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>

11 Benzo(b)fluoranthene

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Benzo(b)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
12	Benzo(k)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
13	Benzoic acid	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
14	Benzo(a)pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
15	Benzo(g,h,i)perylene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(7,17)</sup>
17	Bis(2-chloroethyl)ether	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
18	Bis(2-ethylhexyl)phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
21	Butanol	Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,25)</sup>
22	Butyl Benzyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>

23 Cadmium...



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(7,17)</sup>
24	Carbazole	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
28	p-Chloroaniline	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
32	2-Chlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
33	Chromium	1) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(7,17)</sup>
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>(7,8,16,19)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>(7,8,17,19)</sup>
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method <sup>(8,19)</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
36	Chrysene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
37	Cyanide	Extraction, Distillation, Colorimetric Method <sup>(27,28,29)</sup>
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
39	DDD	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
40	DDE	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
41	DDT	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
42	Dibenz(a,h)anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
43	Di-n-Butyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
47	3,3-Dichlorobenzidine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
53	2,4-Dichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
58	Diethyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
59	2,4-Dimethylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
60	2,4-Dinitrophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
61	2,4-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
62	2,6-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
63	Di-n-Octyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
67	Fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
68	Fluorene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
70	Heptachlor epoxide	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
73	n-Hexane	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup> 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method <sup>(13)</sup>



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
74	$\alpha$ -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
75	$\beta$ -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
76	$\gamma$ -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
77	Hexachlorocyclopentadiene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
78	Hexachloroethane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
79	Indeno(1,2,3-cd)pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
80	Isophorone	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
81	Lead	1) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(7,17)</sup>
82	Manganese	1) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(7,17)</sup>
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(20)</sup> 2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry <sup>(21)</sup> 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method <sup>(30)</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup> 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,25)</sup>
85	Methoxychlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
88	2-methylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
89	2-Methylnaphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
91	Naphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
92	Nickel	1) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(7,17)</sup>
93	Nitrobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
94	N-Nitrosodiphenylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
95	N-Nitrosodi-n-propylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4,6-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5,6-Heptachlorobiphenyl - 2,2',3,4',5,5',6-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
97	Peritachlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
98	Phenanthrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
99	Phenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
100	Pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
101	Selenium	1) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(7,17)</sup>
102	Silver	1) Digestion, Inductively Coupled Plasma Method <sup>(7,16)</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>(7,17)</sup>
103	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,26)</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,26)</sup>
108	TPH (C <sub>5</sub> -C <sub>8</sub> )	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
109	TPH (C <sub>8</sub> -C <sub>16</sub> )	1) Automate Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Solvent Extraction, Gas Chromatographic Method <sup>(12,22)</sup> 3) Ultrasonic Extraction, Gas Chromatographic Method <sup>(22,31)</sup>
110	TPH (C <sub>16</sub> -C <sub>35</sub> )	1) Automate Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Solvent Extraction, Gas Chromatographic Method <sup>(12,22)</sup> 3) Ultrasonic Extraction, Gas Chromatographic Method <sup>(22,31)</sup>
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(15,25)</sup>



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
115	2,4,5-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
116	2,4,6-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
118	Vanadium	1) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
119	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
121	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
122	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
123	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
125	Zinc	1) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>

## เอกสารอ้างอิง

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ที่ อก ๐๓๓๐(๓)/ ๔ ๑ ๒ ๑

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๕ เมษายน ๒๕๖๗

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๒๔ มีนาคม ๒๕๖๗

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓ ราย

- |                          |                            |
|--------------------------|----------------------------|
| ๑) นางสาวพรรณธิดา พุ่มคง | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๕ |
| ๒) นายกำชัย สุทธระ       | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๑ |
| ๓) นางสาวศุภรดา ปันมยุรา | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๘ |

๒. ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๑๒ ราย

- |                             |                            |
|-----------------------------|----------------------------|
| ๑) นางสาวฐานิดา กลิ่นเขียว  | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๒ |
| ๒) นางสาวกัญญ์กิสสร สายคำ   | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๓ |
| ๓) นางสาวณัฐนันท์ กันทะวงศ์ | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๔ |
| ๔) นายอำนาจ วงษาเคน         | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๕ |
| ๕) นายกฤษณพล ปิณญาวงศ์      | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๖ |
| ๖) นายณชากร ทรธรา           | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๗ |
| ๗) นายวัชรินทร์ ผ่องสามสวน  | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๘ |
| ๘) นายณัฐพงศ์ ไสภา          | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๙ |
| ๙) นายศักรินทร์ ปานเพ็ง     | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๙๐ |
| ๑๐) นายณัฐพล ชุ่มชื่น       | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๙๑ |
| ๑๑) นายธนา สุพาพันธุ์       | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๙๒ |
| ๑๒) นายนราธร แก้วพงษ์ชา     | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๙๓ |



อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
ในวันที่ ๒ กันยายน ๒๕๖๔

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

  
(นายพรยศ กลั่นกรอง)  
รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๔๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



ที่ อก ๐๓๑๐(๑)/ ๑๒๓๖ ๘ /

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๑๘ ธันวาคม ๒๕๖๗

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขณัตติสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๒ ธันวาคม ๒๕๖๗

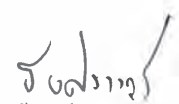
ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ  
วิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ  
เขตสวนหลวง กรุงเทพมหานคร ขอยกเลิกบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์  
จำนวน ๘ ราย ได้แก่

๑) นายประพจน์ วรรณชูชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๐
๒) นายจิรณัฐ ขวละอ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๒
๓) นายพีรพัฒน์ กำคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๐๘
๔) นางสาวอรยา คำคล่อง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๔
๕) นายกิตติพงศ์ แซ่ลี	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๔
๖) นายจิรเมธ ประเสริฐศิริพงศ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๐
๗) นายภัทรพงษ์ มณฑาทอง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๗
๘) นางสาวจากรวรรณ กระจำพันธ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๑

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

  
(นายอิทธิศักดิ์ อิศรางกูร ณ อยุธยา)  
รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๔๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



ที่ อก ๐๓๒๐/ ๗ ๕๓ ๘



กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๐๘ สิงหาคม ๒๕๖๗

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบลอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์  
เอกชน ลงวันที่ ๒๗ พฤษภาคม ๒๕๖๗

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เอแอลเอส แลบลอราทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๓ แผ่น

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบลอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุ  
หนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๓๒๓ สถานที่ตั้งเลขที่ ๖๓๖/๓๑ หมู่ที่ ๕  
ตำบลแม่น้ำคู อำเภอบางบาล จังหวัดพระนครศรีอยุธยา ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบลอราทอรี กรุ๊ป (ประเทศไทย)  
จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมห้องปฏิบัติการวิเคราะห์เอกชน

๑) นายเดช ข้างขน	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๐๑
๒) นางวิลาวัลย์ บริรักษ์	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๐๒
๓) นายสุพจน์ สลามเต๊ะ	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๐๓

ข. เจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน

๑) นายณัฐพงษ์ เพ็ชรขวนา	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๐๑
๒) นางสาวกัญญพรคนี รักดี	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๐๒
๓) นางสาวจุฑารัตน์ สีทองหลวง	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๐๓
๔) นางสาวจิตสุภา ประเทืองสุข	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๐๔
๕) นายสรวิชัย คุ้มยกสุข	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๐๕
๖) นายณัฐวุฒิ ออมพรมราช	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๐๖
๗) นายจิตรกร สีวะสา	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๐๗
๘) นายสิททิพย์ สุวรรณรัตน์	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๐๘
๙) นายสิทธิพันธ์ เสนาชีว	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๐๙
๑๐) นายอนุวัฒน์ เตมา	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๑๐
๑๑) นายสุรวิทย์ นราพงษ์	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๑๑
๑๒) นายณัฐพล เจริญวิวงศ์	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๑๒
๑๓) นายชานนัท บุญชื่น	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๑๓
๑๔) นายณัฐกานต์ วงศ์อินทร์อยู่	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๑๔
๑๕) นายอานนท์ โพธิ์พระทอง	ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๑๕

๑๖) นายณัฐพล...

-๒-

๑๖) นายณัฐพล ถ้ำกลาง  
๑๗) นายศุภณัฐ พิสัยพันธ์  
๑๘) นายวสันต์ คินันติ  
๑๙) นายวรัญญู ฉิมพาลี  
๒๐) นายศุภณัฐ สกฤตติมงคลศักดิ์  
๒๑) นายเอกชัย ถิ่นทอง  
๒๒) นายพงษ์เทพ สิทธิเลา  
๒๓) นายทินกร กุมภา  
๒๔) นางสาวนันทยา บุญจันทร์  
๒๕) นายสิทธิชัย อันพิมาย  
๒๖) นางสาวปภาณิน หลอดทอง  
๒๗) นางสาวพจนา สีดา  
๒๘) นางสาวธนิศา กุลศิริวงศ์  
๒๙) นายพิทยา ทองแดง  
๓๐) นางสาวชลธิชา สูงเกษ  
๓๑) ว่าที่ร้อยตรี รณชัย ม่วงมา  
๓๒) นายวราวุฒิ พับพา  
๓๓) นายศักดิ์นรินทร์ จรัสกาย  
๓๔) นายสุรศักดิ์ สาชิน  
๓๕) นายสถาพร ถาแก้ว  
๓๖) นายสุทธิดำรง โชคปิตินันท์  
๓๗) นายวัลลภ หันไชยเนาว์  
๓๘) นางสาววนาลี เจริญญะตระกูล  
๓๙) นายธนะสิทธิ์ วงศ์ไชย  
๔๐) นายชัยนุสรณ์ เลิศนันทกุลชัย  
๔๑) นายสัจจา เพ็ชรแสวง  
๔๒) นายกณตภณ มณีสัมพันธ์  
๔๓) นายธารินทร์ อ็อกจินดา  
๔๔) นายศุภชัย วงศ์สุริย์ฉาย  
๔๕) นายไสว ต้นโพธิ์  
๔๖) นางสาวกิตติยา สัญญาอาริยาภรณ์  
๔๗) นางสาวธิดารัตน์ ศิริมงคลโร  
๔๘) นายพิพัฒน์ นิภัทรเศรษฐ์  
๔๙) นายศิริวิทย์ เรืองสม  
๕๐) นายปารเมศ สัตยาคุณ  
๕๑) นายนฤนาท ธรรมะโร  
๕๒) นางสาวศุภรัตน์ โลจันทร

ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๑๖  
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ทะเบียนเลขที่ ว-๓๒๓-๓-๐๐๕๓

๕๒) นายพชรกร...

๕๒) นายพชรกร เจริญ	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๔
๕๓) นายทิวากร เชื้อมาก	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๕
๕๔) นายอนุวัช ทองขจรศักดิ์	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๖
๕๕) นายอภิชาติ วิลาศ	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๗
๕๖) นายจรัสศรี ศรีรักษา	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๘
๕๗) นายประสานมิตร เชื้อนเพชร	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๕๙
๕๘) นายภาณุวัฒน์ วิงบง	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๖๐
๖๐) นายสันติ ชัยชนะ	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๖๑
๖๑) นายทินกร กุลชาติ	ทะเบียนเลขที่ ว-๓๒๓-จ-๐๐๖๒

ค. ขอบข่ายชนิดสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒๘ มิถุนายน ๒๕๖๓ หากประสงค์จะต่ออายุหนังสือ รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๖๐ วัน ก่อนวันสิ้นสุดอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

  
(นายพริต กอนกรอง)  
รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

โทร. ๐ ๓๓๑๓ ๖๐๕๖ ต่อ ๕๐๐๑-๒

ไปรษณีย์อิเล็กทรอนิกส์ [envw@dlw.mail.go.th](mailto:envw@dlw.mail.go.th)



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๓๒๓  
ที่ ออก ๐๓๒๐/ ๗ ๕๓ ๘ ลงวันที่ ๐๔ สิงหาคม ๒๕๖๓

ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๕ รายการ  
น้ำเสีย จำนวน 14 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Biochemical Oxygen Demand	1) 5-Day BOD Test, Membrane Electrode Method <sup>[2]</sup> 2) 5-Day BOD Test, Azide Modification Method <sup>[2]</sup>
2	Chemical Oxygen Demand	1) Open Reflux, Titrimetric Method <sup>[2]</sup> 2) Closed Reflux, Colorimetric Method <sup>[2]</sup> 3) Closed Reflux, Titrimetric Method <sup>[2]</sup>
3	Color	ADMI Weighted-Ordinate Spectrophotometric Method <sup>[2]</sup>
4	Cyanide	Distillation, Colorimetric Method <sup>[2]</sup>
5	Formaldehyde	Distillation, Colorimetric Method <sup>[1]</sup>
6	Free Chlorine	DPD Ferrous Titrimetric Method <sup>[2]</sup>
7	Oil and Grease	Liquid-Liquid, Partition-Gravimetric Method <sup>[2]</sup>
8	pH	Electrometric Method <sup>[2]</sup>
9	Phenols	1) Distillation, Chloroform Extraction Method <sup>[2]</sup> 2) Distillation, Direct Photometric Method <sup>[2]</sup>
10	Sulfide	ZnS Precipitation, Iodometric Method <sup>[2]</sup>
11	Temperature	Field Method <sup>[2]</sup>
12	Total Dissolved Solids	Dried at 180 °C <sup>[2]</sup>
13	Total Kjeldahl Nitrogen	Semi-Macro Kjeldahl Method <sup>[2]</sup>
14	Total Suspended Solids	Dried at 103-105 °C <sup>[2]</sup>

น้ำใต้ดิน จำนวน 3 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method <sup>[2]</sup>
2	pH	Electrometric Method <sup>[2]</sup>
3	Phenols	Distillation, Direct Photometric Method <sup>[2]</sup>

อากาศเสีย...



อากาศเสีย (ปล่อยระบาย) จำนวน 7 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Carbon Monoxide	1) Sampling Bag, Non-Dispersive Infrared Method <sup>[5]</sup> 2) Instrumental Analyzer Method <sup>[9]</sup>
2	Hydrogen Sulfide	Absorption Sampling, Iodometric Method <sup>[5]</sup>
3	Opacity	Ringelmann's Method <sup>[3,4]</sup>
4	Oxide of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method <sup>[8]</sup> 2) Instrumental Analyzer Method <sup>[10]</sup>
5	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Acid Method <sup>[5]</sup> 2) Instrumental Analyzer Method <sup>[11]</sup>
6	Sulfuric Acid	Isokinetic Sampling, Barium – Titrimetric Method <sup>[6]</sup>
7	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method <sup>[7]</sup>



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7. United States...

7. United States Environmental Protection Agency. **Standards of Performance for New Stationary Sources**. 40 CFR 60. Appendix A, 2020.

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ที่ อก ๐๓๒๐/ ๑๐๐๕ ๕



กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๐๕ ตุลาคม ๒๕๖๗

เรื่อง แก้อิสรายชื่อเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง หนังสือ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขที่ Env.2024/005  
ลงวันที่ ๓๐ สิงหาคม ๒๕๖๗


ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ  
วิเคราะห์เอกชน เลขทะเบียน ว-๓๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่น้ำคู้ อำเภอปลวกแดง  
จังหวัดระยอง ขอแก้ไขชื่อเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน เนื่องจากมีความคลาดเคลื่อน ความละเอียด  
แจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรม ได้รับทราบและดำเนินการแก้ไขรายชื่อเจ้าหน้าที่ห้องปฏิบัติการ  
วิเคราะห์เอกชน จำนวน ๕ ราย ตามที่แจ้งเรียบร้อยแล้ว เป็นดังนี้

ลำดับที่ ๒๗ นางพจนา สีดา  
ลำดับที่ ๒๘ นางสาวอนิศา กุลสุวิวงศ์  
ลำดับที่ ๓๐ นางชลธิชา สุนงกษ  
ลำดับที่ ๓๖ นายสุทธิดำรงค์ โชคปิตินันท์  
ลำดับที่ ๔๒ นายกันตภณ มณีสัมพันธ์

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

  
(นายพรยศ กลั่นกรอง)  
รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก  
โทร. ๐ ๓๓๑๓ ๖๐๕๔ ต่อ ๕๐๐๑-๒  
ไปรษณีย์อิเล็กทรอนิกส์ eirw@div.mail.go.th

 "อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ อก ๐๓๑๐(๓)/ ๕๒ ๕ ๖



กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๐ พฤษภาคม ๒๕๖๘

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

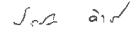
อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๑๐ เมษายน ๒๕๖๘

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ  
วิเคราะห์เอกชน เลขทะเบียน ว-๓๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่น้ำคู้ อำเภอปลวกแดง  
จังหวัดระยอง ขอยกเลิกบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน  
จำนวน ๑ ราย ได้แก่ นายปารามศ สัตยาคุณ ทะเบียนเลขที่ ว-๓๒๓-จ-๐-๐๐๕๑

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

  
(นายประสม ดำรงพงษ์)  
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน  
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก  
โทร. ๐ ๓๓๑๓ ๖๐๕๔ ต่อ ๕๐๐๑-๒  
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ที่ อก ๐๓๑๐(๓)/ ๕๕๐๙



กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

## ๒๗ พฤษภาคม ๒๕๖๘

เรื่อง เปลี่ยนแปลงชื่อ-สกุลบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๑๕ พฤษภาคม ๒๕๖๘

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ  
วิเคราะห์เอกชน เลขทะเบียน ว-๓๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่น้ำคู้ อำเภอลำลูกเกด  
จังหวัดระยอง ขอเปลี่ยนแปลงชื่อ-สกุลบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้เปลี่ยนแปลงชื่อ-สกุลบุคลากร จำนวน ๑ ราย  
จากนายธนະสิทธิ์ วงศ์ไชย เป็น นายอมลวิชัย วงศ์ไชย

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายประสม ดำรงพงษ์)

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน  
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

โทร. ๐ ๓๓๑๓ ๖๐๕๕ ต่อ ๕๐๐๑-๒

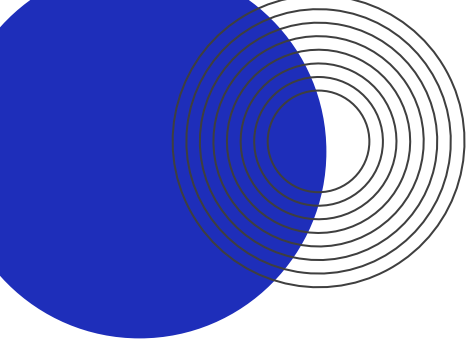
ไปรษณีย์อิเล็กทรอนิกส์ eirw@diw.mail.go.th



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